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THE WORKS OF THE LATE RICHARD M. HUNT.

A REVIEW of the career, extending now over forty years, of one of the most conspicuous and distinguished American architects ought to be instructive in more than one respect. It is to a considerable extent an exponent of the national development during the period which it covers. It indicates, of course, with some precision the progress of the public appreciation in architecture, for the co-operation of the public is indispensable to a career or even a livelihood in the practice of that art.

A poet may be neglected in his lifetime to become posthumously popular. A painter, if he have the means of living, may produce works unintelligible to his contemporaries that will be eagerly sought after his death. A musician may devote his life to the production of works which he himself never has the opportunity of hearing, but which may be brought to light and presented for the first time, like so many of Sebastian Bach's, after he has been for generations in his grave. But an architect cannot even produce without the co-operation of his public, nor can he leave plans, which bear the same relation to his art as a score to the musician's, with any hope that they will be executed after his death, since the actual conditions of any architectural problem are never the ideal conditions of the "project." Undoubtedly the

work of an architect reacts upon the popular appreciation and tends to raise or to degrade the accepted standard. But if it do not appeal at all to popular appreciation, it is unlikely to get itself executed, or if the designer gets one building to do which does not commend itself to his clients or his public, he increases the unlikelihood that he will get another.

This is true of the practice of architecture anywhere. But in this country and for the last forty years the series of a successful architect's works denotes also the great social changes that have taken place in that period in the change in the nature of the problems that come to him for solution, in the steady and rapid increase of the magnitude and costliness of the buildings he is called upon to rear. Compare the New York dwelling of the first class of forty years ago with the like dwelling of to-day. The bourgeois mansion has expanded to a palace. With this expansion Mr. Hunt has had as much to do as any other architect. A still more striking example is that of Newport, with the expansion of which he has had so much more to do than any other architect. This example is more striking because it is only within the last twenty years that it has been customary for architects to be invoked specially to design New York houses even of the first class. Forty years ago the chances were that the humble and simple-minded million-

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aire of the period would live in a ready-made house, and the mansions of millionaires strongly resembled each other. Newport was already forty years ago our show watering place, and even then the millionaire who was contented in town to live as other people lived, and who had to look twice to see whether he was in his own dining-room or his neighbor's, insisted upon having his country house made for him, with some special recognition in its arrangement of his personal needs and habits. The expansion of the Newport cottage of 1855 into the Newport palace of 1895 affords an epitome of the history of the United States for the interval and furnishes matter for the discourse of the social philosopher as well as of the architectural critic.

It was precisely in 1855 that Richard Morris Hunt returned to New York from his professional apprenticeship in Europe and began the career of which we are to consider the progress. Born in Brattleboro, Vermont, October 31, 1827, the son of Jonathan Hunt, M. C., and the younger brother of William Morris Hunt, the painter, he was graduated at the Boston High School in 1843, and the same year, having already chosen his profession, he went to Europe. In 1844 he entered the atelier of Samuel Darier in Geneva, in 1845 that of Hector Lefuel in Paris, and for the ensuing nine years pursued his professional studies at the Beaux Arts, making journeys in Europe, Asia Minor and Egypt. In 1854, his *patron* having been put in charge of the new work on the Louvre, he was appointed inspector, and under Lefuel designed the Pavillon de la Bibliothèque, opposite the Palais Royal.

This professional preparation would even now be unusually long and thorough, and was still more unusual then, when there was scarcely an architect in the United States who had served a regular apprenticeship to his calling. It was to be expected that after so long an apprenticeship the earliest independent essays of the young practitioner should bear very strongly the stamp of the school. One attends a place of artistic instruction to find his handwriting, as the phrase goes, to gain the

power of expressing himself. But at first it is almost inevitable that he should write the penmanship of the school. Especially is this the case when the tradition of the school is so powerful as at Paris, and where the performances of most of its native graduates seem to foreign observers to be so academic as to lack individuality. Indeed, what we are apt to call academic in the case of French architecture is rather the educated expression of a national trait. A main result of French training and French traditions is the discouragement of eccentricity, and necessarily this implies the repression of individuality, unless this happen to be very marked indeed. In the aspect of Paris one is so much more impressed with the high level of general architectural attainment than with the excellence of individual performances that the city seems to have been built by the State rather than by its citizens. When the American graduates of Paris return to take part in the building of their own country it is very apt to seem that their aim, especially in the first essays, is rather to reproduce Paris than to solve American problems. Sometimes one is even inclined to describe their work as the schooling of the Beaux Arts operating *in vacuo*.

The difference between the French and the Anglo-Saxon ideal is visible as soon as one crosses the channel in the difference between the rambling, irregular and picturesque manor-house or farmstead, and the formal, symmetrical and pompous arrangement of the Norman country-house, with its flanking barns and offices. The English country-house, even when it is palatial in scale and cost, seems to disclaim palatial pretensions, while the French country-house, even when it is far below the palatial scale, seems to aim at being "monumental." The difference goes much deeper than the "battle of the styles," which is one manifestation of it, insomuch that the American practitioner applying his French training seems to be engaged in fighting nature. One of the most instructive results of a study of Mr. Hunt's career seems to me to lie in ob-

serving the action and reaction between an intensely American nature and a thoroughly European training, issuing in a complete reconciliation only after many years.

For example, if the young architect had stayed at home and received such training as was to be had in the United States, I make no doubt that he would have been one of the leaders of the Gothic revival. Trinity Church had been finished for ten years when he returned home, and with other churches of its architect had had the effect of turning the minds of aspiring native architects to the possibilities of Gothic. Whatever architectural life there was in the country took this direction. Indeed, there was little, for architecture was never at a lower ebb in any country than it was in the United States at the middle of the century. The decent colonial tradition had died out altogether, the Greek revival which had produced many public buildings in the towns, and had dotted the country with villas in wooden reproduction of temples had spent its force, and the ignorant and emancipated carpenter was doing terrible things throughout the land, being unfortunately aided in his nefarious work by the facilities afforded by the introduction of the jig-saw for the cheap multiplication of such ornament as it seemed good to him to invent or to "adapt." There never has been a time when the services of educated designers were more needed or when the public, debauched as it was by the vagaries of ignorant designers, was less prepared to appreciate their work. As has been said, the only organized protest had been made and was making by the small body of designers, native or imported, who reflected the English taste, and who were doing something in ecclesiastical architecture, at least, to improve the current and lawless modes of building; and they were endeavoring to establish a new tradition in an art which had lost all its traditions. With them every newcomer would naturally associate himself unless he was already under the influence of a more powerful tradition, as was the case with a graduate of the Beaux Arts.

The first town-house designed by Mr. Hunt must have been a surprise to the New York of that time. It was the Rossiter house in West Thirty-eighth street, since demolished but happily surviving in photography. It is not only an unmistakable product of the Beaux Arts, but it is specifically inspired by Lefuel's work on the Louvre, as witness the banded shafts and the carved pediment that crowns the centre. The absolute symmetry decreed at Paris is maintained, it will be observed, even to the construction at the flank opposite the entrance of an architectural counterpart of the entrance and to the blind arches that flank the opening of the upper story. For the rest it is an evidently educated performance and as such was calculated to exert a beneficial influence in the prevailing chaos. It will be observed that it did exert such an influence upon its immediate neighbor to the left in which its details are repeated in a simplified form by a builder of exemplary docility.

Equally of the Beaux Arts is the Studio building in West Tenth street, erected the next year (1856) after the Rossiter house, and the earliest of its author's works still left standing in New York. It is in humbler material than the dwelling, and of a more strictly utilitarian design. Its interest is rather in planning than in architectural development, and it is so successful in this respect that, in spite of the changes and chances of New York in forty years it is still attractive to the tenants for whom it was built and still occupied as a studio building.

The first of Mr. Hunt's Newport houses is an object, it may fairly be said, of historical interest, for it was the precursor of a long series which for at least twenty years, and until the cottage had expanded itself successively into a villa and a palace, continued to give its architectural character to our most famous watering place. It was the era of the Mansard roof which would have horrified Mansard, and of which the obvious cheapness and convenience and room-saving qualities commended it to the American builder, who addicted himself passionately to



West 38th street, New York City.

ROSSITER RESIDENCE.

it, without regard to the fact that in the form which it took in his hands it was architecturally the most intractable form of house-covering that was ever devised. Our vernacular construction was, as it always has been since the saw-mill displaced the log cabin, a construction of scantling and

and concealing the studding that formed the real construction. The *projets* of the Beaux Arts do not concern themselves with clapboards, and the young architect trying to compose architectural objects in the vernacular found himself thrown, much more than in city houses of masonry, upon his own resources, though it is evident that his

sojourn in Switzerland, a land of architectural carpentry, had been of great advantage to him. He shirked neither the clapboard sheathing, nor even the Mansard roof, though his design by revealing or suggesting the real structure took away the impression of a wall of clapboards, which the vernacular carpenter gave, and rendered even the Yankee Mansard roof comparatively innocuous. It can scarcely be said that he succeeded in attaining an architectural composition, for the

known as the Travers, is more successful in general composition, possibly because it is less extensive and complicated, certainly because it has a clearly dominant feature, in spite of the fact that an unmitigated Mansard is here much more than a detail. An avowed reproduction of the Swiss chalet in the vernacular clapboard, done at about the same time, may complete our record of Mr. Hunt's contributions to the Newport of before the war, though it by no means exhausts the list.



Newport, R. I.

RESIDENCE OF J. N. A. GRISWOLD, ESQ.

house, an unusually extensive Newport cottage for that period, lacks unity and tends to straggle. The successes are successes of detail, and many of the details are interesting and suggestive, while at least one feature, the carriage porch, is a spirited and admirable piece of design, in which the treatment of the material is as idiomatic as it is artistic and in which even the emergence of the Mansard roof contributes to the success of a successful and piquant composition. Another example of what is already "Old Newport," the cottage

For these earlier essays no great architectural importance can now be claimed, though they were not without considerable results in their day in bringing about a more intelligent and artistic treatment of the vernacular construction in country houses than would otherwise have been obtained. A more direct utilization of his professional studies was made by the young architect in the preparation of the designs for the four southern entrances to the Central Park, adopted in 1860 by the Park Department, but never begun



Newport, R. I. CARRIAGE PORCH, RESIDENCE OF J. N. A. GRISWOLD, ESQ.



Boston, Mass.

RESIDENCE OF DR. WILLIAMS.

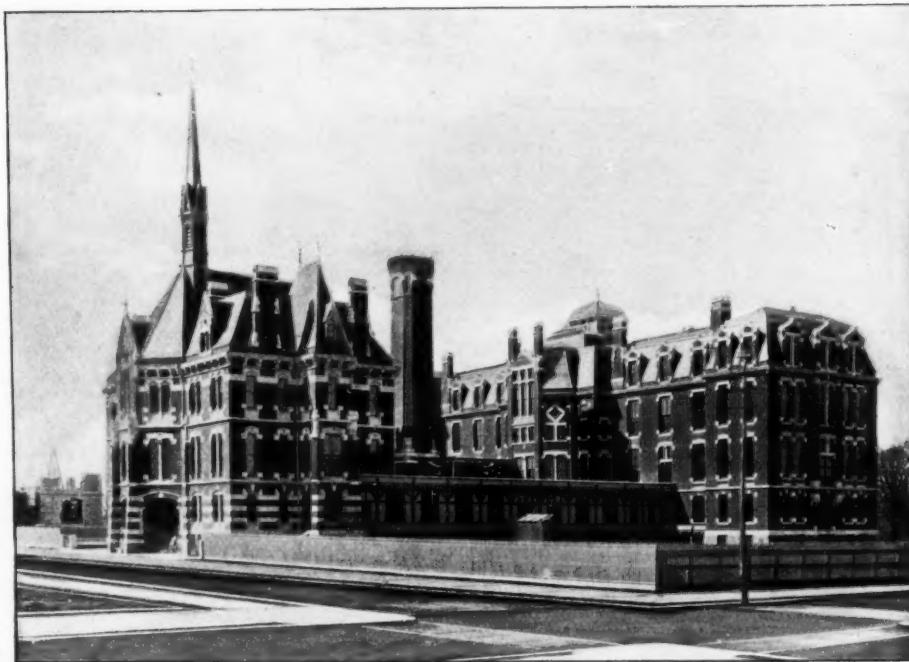
to be executed. The transformation of West Fifty-ninth street has perhaps rendered obsolete the designs for the intermediate entrances at Sixth and Seventh avenues, which would lose their impressiveness by losing their scale when confronted with the towering apartment houses that now line the southern side of that thoroughfare. But it is otherwise with the treatment proposed thirty-five years ago for the terminal plazas. An inspection of these makes it evident that they were very

carefully thought out from the practical as well as from the picturesque point of view. Nothing that has since been done, either in the treatment of the park itself or of its bordering buildings, tends to render them obsolete or inapplicable. As compared with the triumphal arch, which it has lately been proposed to put into competition with the huge hotels that have sprung up about the foot of the park, the designs of 1860 vindicate themselves as appropriate and decorative entrances to a public pleas-

ure ground, and carry out the suggestion of a *rus in urbe*. Indeed, in studying them, we experience a sensible disappointment that they should not have been executed.

The years of the war Mr. Hunt spent largely in Europe and intermittent in some degree his professional activity. Towards 1870 the work began by which he is best known, and it was straightway seen that in urban architecture he had evolved a new and highly individual style, of which his earlier works had scarcely betrayed an intimation. It has been said that it seems that men are born classicists or romanticists as they are born with dark or light hair. In every art temperament triumphs at last over training, and it may even be said that the chief use of training is to enable temperament to manifest itself. Certainly in architecture there are not wanting instances of designers who have managed to formalize if not to classicize the romantic styles and of others who have managed to inject a romantic freedom and picturesqueness into the most settled and conventional forms. I have already recorded my own belief that it was only Mr. Hunt's exceptional training that prevented him from being among the pioneers in this country of the Gothic revival. The so-called romantic movement in French architecture appealed to him as a born romanticist, but he arrived at an individual rendering of it. Indeed, it would not be unfair to describe the most characteristic of his works from 1870 to 1880 as a persistent but unsuccessful attempt to avoid Gothic architecture. It was quite feasible to avoid mediaeval detail, but the spirit and idea, the composition and grouping distinctly recalled Gothic work in buildings in which not a single Gothic form was suffered to appear. New Yorkers will not be at a loss to recall examples of this period, though perhaps the first announcement of it was made in Boston, in the houses of Mr. Martin Brimmer, and a very startling announcement it seemed to the Boston of 1870 to be. It had those qualities which the Beacon street of that day lacked without missing, and it lacked the conformity to

the traditions of the Common upon which Boston insisted. Cultivated Boston found it sprightly and gay and animated beyond what was becoming to the dwelling of a solid man of Boston. We may own, in fact, that the animation was excessive, and went the length of restlessness in this edifice, and in others of the same period. Two houses of similar treatment in Park avenue left New York comparatively calm, although nothing could be more conventional than the prevailing domestic architecture of New York at that time. These essays in domestic architecture were followed by others in commercial and "institutional" building which had the same qualities of sprightliness, animation, spirit, and vigor, but which were apt to attain them at the cost of repose, and which might fairly be called sensational. Those who have considered them will at least know what I mean when I say that they are composed in a too *staccato* style. Of these is the Divinity School of Yale, at New Haven, a very straightforward piece of design, not without picturesqueness, but entirely unrelated to the conventionalities of collegiate architecture, although, exceptionally, it shows here and there a Gothic detail. Another is the administrative building of the Presbyterian hospital, a vigorously-grouped, picturesquely-outlined and aspiring mass, crowned with a *fleche*, and also showing here and there a Gothic detail, but of which the predominant expression is Parisian *chic*. The merits of the design, however, are more or less obscured in execution by the color-treatment. Not only is the contrast between the red brick and the white stone glaring, but it is rendered more vivid by the manner in which the stone-work is employed. In the basement there are alternate courses of stone and brick, but in the superstructure the stone is employed in lintels, which are slightly peaked at the centre, in quoins which are placed under these corbelwise and in similar quoins at the bases of the openings. This disposition necessarily gives to the front to which it is applied a confused and "spotty" aspect which is unfavorable to repose, and which the vigor of the detail and



PRESBYTERIAN HOSPITAL.

East 70th and 71st streets, New York City.

the undeniable spirit and success of the composition do not succeed in redeeming. Indeed the color-treatment, which is a detail in the design, is so much more than a detail in the execution that the design is more readily apprehended from the photograph than from the building, so that it seems safe to say that had the design been executed in monochrome the building would have been more successful.

It seems safe also to pass a similar judgment on the *Tribune* building. When we consider that it was the first of the elevator buildings, that it was literally unprecedented, and an initial attack upon a problem at which a whole generation of designers have been working for the twenty intervening years, it is clear that every needful allowance must be made for its shortcomings. Indeed, the allowances that need to be made are surprisingly few, and perhaps the chief drawback to the success of the completed work is what was merely a detail in the design, and that is again the employment of color. The contrast between the granite and the brick is so

vivid, and the granite is so applied in patches rather than in accentuation of the main lines and features of construction as in a great degree to obscure the design, alike in the photograph and in the fact, and to concentrate attention upon what in the design is a very minor matter. To appreciate this it is necessary only to compare the basement, which is a monochrome of granite, and the colonnaded seventh story, which is distinctly bounded by the continuous cornice and the continuous sill-course in granite with the intervening stories to note the superiority of these features in coherency and unity. The design, however, remains very interesting. It was generally assumed by educated architects who had elevator-buildings to do in the early days of elevator-buildings, that it was necessary to employ in these towering structures a unit of design made up of several stories to supply the place in the composition of the single story of a lower building. The analogy that is now commonly accepted of a column, in which the midmost division, the shaft,



New York City.

TRIBUNE BUILDING.

is much the tallest, and may and should be made continuous by identity of treatment of its parts is a comparatively recent discovery. In the early efforts the grouping of stories into an architectural story was managed, sometimes by merely extending the openings, and making the floor-lines appear as transoms, as in the Equitable, sometimes by constructing main divisions, marked by arches or orders. It has seldom been done more rationally than in the *Tribune* building, where the segmental arches turned between the main piers, and including three stories are not without structural significance, while they neither dissemble nor belittle the actual division into stories nor the separateness of these. The basement is admirably simple and massive; the roof-stage with the very lofty dormers suitable to and required by the special uses of the building, forms with the tower a picturesque crowning feature, and the earliest of the elevator buildings remains one of the most interesting and suggestive, even though it be true that the combination of its materials interferes with one's appreciation of the design, and that a tamer and less varied treatment of the main wall would have enhanced its effectiveness.

This seems to have been, on reflection, the opinion of the architect, for in a later and more successful work, the most successful, it seems to me, of Mr. Hunt's commercial buildings, the treatment is modified accordingly. This is the Guernsey building, in lower Broadway. In this neither the difficulty nor the opportunity was so great. On the one hand the building is but of seven stories, and it is well known that the difficulties of an elevator building increase with the addition of every story after the original five. On the other it does not occupy a detached site, but is a mere street front. Here the unit of design is the story and not a multiple or combination of stories. The composition is simplicity itself. A basement of two stories in stone, with an entrance on one side prolonged through the two, supports a superstructure of five in brick and stone, of which the upper is set off by a cor-

belled string course as an attic while the four intermediate are identically treated, and each is emphatically marked by a projecting course. The bay allotted to the entrance is distinguished throughout in treatment and above the fourth story the wall of it is slightly projected so as to account for a separate and towerlike roof, while the attic is lightened and enriched. There is no lack of animation in the design, but there is also no lack of repose. The detail is vigorous and telling without excess in quantity or scale.

The Coal and Iron Exchange in Cortlandt street, between the *Tribune* building and the Guernsey building in date, is more successful than the former, even though less interesting, and both less successful and less interesting than the latter. Success, however, was an easier attainment here than in either of the other cases. The building has two sides free, though since its erection the shorter has been obscured by the structure of the elevated railroad, and though it was built after the elevator had been introduced it is not an elevator building. The frontage is of the ample breadth of 125 feet and of the not immoderate height of six stories, including a Mansard. Both the vertical and the horizontal divisions are well marked. The former begins with a battering basement of Dorchester stone, which material is used throughout in conjunction with red brick and affords to it a contrast that is effective without being violent. The batter is a questionable feature, so questionable that it has not since been reproduced under conditions at all similar either by its own architect or by any other. This basement counts in with the story above as a member of the composition, in spite of the difference of material, the two being set off from the next division above by an emphatic string course, and furthermore united at the centre by the entrance, which is the chief decorative feature of the front. To give an entrance importance by extending it through two stories, the actual entrance being in the lower, is a common enough device. It has rarely been managed with more discretion and success than in this instance, where



Broadway, New York City.

GUERNSEY OFFICE BUILDING.

it is very plainly given to be seen that the second stage of it is a mere decoration, both by the heavy transom which crosses the actual entrance and by the detachment from the wall of the two corbelled columns above that signalize the entrance, and of the arch of three large voussoirs that connects them. The next stage is of two stories included under tall segmental openings with heavy springers of stone, sharply separated from the lintelled story above, which in turn is separated from the roof-story by the main cornice. The lateral division is fivefold, for which the frontage gave ample room, consisting of a central pavilion, corresponding to the entrance, covered with a triple dormer, terminal pavilions, and curtain walls between, the differences in treatment being slight but quite sufficient to mark the division. The detail is still unmistakably neo-grec, but it is by no means so insistent as in the architect's earlier works in the same kind, as in the Brimmer houses, in the buildings for the Divinity School at New Haven, in the Victoria Hotel, or in the Presbyterian Hospital. Not all of these, indeed, can be classified as neo-grec at all, though they all bear unmistakably the same impress, and are in the same manner, whatever difference of detail a minute examination may reveal. The detail here is, if I may say so, less sudden; it is more crisp and effective. The defect of the Coal and Iron Exchange seems to me, nevertheless, to be clearly a defect of the style, a certain heaviness and starkness which comes from the effort to substitute mere surface-decoration by incised lines in reproduction of admired lines of classic forms for actual modification of form by means of moulding. This defect does not efface the merits of the building, nor prevent it from being a sober, dignified and impressive performance.

I have refrained thus far from speaking of the neo-grec, in which so many of the works of this period were composed, domestic, institutional or commercial, because, whatever the value of the neo-grec, it is clear that Mr. Hunt arrived at an individual render-

ing of it, and it is the individual quality that I have been trying to detach. But it is not possible to treat the work of an architect so academic in his ways of considering his problems without some reference to the styles in which they are severally designed. Mr. Hunt, except in works which seemed to him ephemeral and occasional, mere *jeux d'esprit*, has always "worked in styles," has commonly abjured such eclecticism as had not already been formulated, and has manifested his own individuality, after the choice of the style which seemed to him to suit best the special problem presented to him, within the limits of that style. Neo-grec was not only, at the time when he finished his studies, a current fashion, but it made much more serious pretensions than that. It professed to offer the reconciliation of the classicism of the schools with the new romantic impulse. It is no wonder that it should have seized with a special force upon the imagination of an American student of architecture in France, and that he should have taken to its practice with enthusiasm. If I am right in what I have said of the contradiction between his temperament and his training, whatever promised a reconciliation must have been alluring to him, and would naturally have led him to the kind of experimentation which is shown in his work of twenty years ago. That this experimentation was upon the whole unsuccessful in its ultimate end of attaining a new and comprehensive style may be inferred, in general, from the fact that neo-grec is no longer practiced nor discussed in the land of its origin, and has there been relegated to the category of fashions that have passed. It seems to me that the reason of this is the perception of failure that comes from actual and systematic attempts to unite forms of detail that are admired by all the world, either in their fullness or in their lines, with modes of construction to which they are alien, and which, to become styles of architecture, must grow their own detail. In our particular instance the confession may be inferred from the fact that it is nearly twenty years since Mr. Hunt abandoned absolutely the style

in which for ten years or more he had wrought so much, and betook himself, in his later and his far more successful work, to another transitional style in which the complete fusion of diverse elements was neither attained nor even attempted. But if his works in the neo-grec cannot be admitted to be successful in their ultimate aim, they show so much of individuality, of invention and of life as to be incidentally and intrinsically extremely interesting : and it would not only be preposterous, but it would be doing their author's powers a serious injustice not to consider and to illustrate fully by the most characteristic examples a phase in his career which is in itself so characteristic.

In considering the commercial buildings we ought not to forget two experiments in iron-work. In his metallic detail Mr. Hunt is almost always successful, as witness the elaborate grill illustrated at the end of this article and the characteristic and effective treatment of metal in the openings of the Hotel Victoria. But an iron store front is another matter, and many of the architects of twenty years ago were condemned for their sins to try their hands at iron store fronts. The architectural iron works used to have façades on hand of any style you wanted, only they were of no style that the judicious wanted, being only imitations of masonry. The architects, when they were appealed to, made various kinds of struggles to respect the material. Among these efforts none were more interesting than the two fronts erected on the east side of middle Broadway from Mr. Hunt's designs about twenty years ago. Each had the fundamental merit of being unmistakably designed for its material. The first was a series of openings three high and three wide, each of the two lower containing two stories, and the upper an attic of a single story with a strongly projecting coved cornice. The uprights are decorated with columns, very much more slender than classic proportions would permit, connected by light segmental arches filled with tracery. It is this building which Professor Kerr has done the honor of choosing as a most fa-

vorabile example of the iron store front, for his continuation of Fergusson, and of it he remarks that the architect has "produced a composition which is decidedly unobjectionable and not inartistic." In the other the designer has employed Moorish motives, and especially the horse-shoe arch, as congruous with the nature of the material, and indeed the arches here, with their hanging cusps, promote the impression the whole front makes of being unmistakably metallic, and excluding any other material than metal. Moreover, the radical weakness of the material as a material for permanent structures, its liability to rust, is here taken account of, and in each case the painting which an iron front needs for its preservation is made an important element in the decoration. The "iron age" in commercial building produced nothing better than these two fronts and very few things so good. But, like the other comparative successes they indicated that the problem was not really soluble. It is a matter of congratulation upon architectural grounds that at about the time when these fronts were done, experimentation in iron fronts should have been brought to an end by the demonstration of the fires of Chicago and Boston that fronts of unprotected iron-work were not practically trustworthy, and architects were thus released from the attempt to solve the insoluble.

As it fell to Mr. Hunt to design the first elevator building for commercial uses—or one of the first, for the *Tribune* building and the Western Union building were contemporaries—so it fell to him to design the first of the elevator apartment houses, the Stuyvesant in East Eighteenth street. For some time apartment houses of a higher grade than the tenement house had been coming in, but they were planned and designed by their builders without much real consideration of their requirements and without any knowledge of what had been done elsewhere, and the stairs were the only means of access to the upper floors contemplated by their builders. The Stuyvesant was planned with reference to its purpose and to the new facilities of ascension,

and so successfully planned that it is still occupied by tenants of the same class for which it was built. It was a modest essay, being but four stories of apartments, surmounted by a very tall roof-story of studios. Architecturally it remains one of the best of the apartment houses, the unusual height of the crowning story becoming an effective member of the composition, the detail, more Gothic in effect than the designer commonly permitted himself, is careful and successful, the combination of color effective and the piquancy of the front is gained without loss of unity or repose. The Victoria Hotel, as it is now, originally called an apartment house, is a much more ambitious and developed example of elevator architecture, regular and grandiose in composition, ingenious and clever in detail, especially, as has been intimated, in the detail of iron-work and masonry in the basement, and perhaps the most Parisian in effect of anything of its period or of its author, so Parisian indeed that it is difficult to characterize it without resorting to French and pointing out how it has *chic* and how it has *élan*.

Characteristic as all these things are they represent but one phase of the artist's work for the decade of 1870-80. He was actively employed in country houses, and the Newport house was already undergoing an expansion from a cottage properly so-called, not indeed into the palace which is the latest phase of its evolution, but at least into a villa. Of this type of country house, which is no longer a mere summer-place, but is apparently available for residence all the year round, there is no better example than the Newport house of Mr. Marquand, which has freedom and animation, and yet is chastened into unity and repose in spite of its comparatively complicated disposition and its variety of material, the stories being successively of rubble, brick-work and wood. The treatment of these materials is so straightforward and idiomatic, and the disposition of the fronts so successfully overruled into a composition, that the house bears no mark of any passing fashion, and by no means dates itself so accurately as

most of its contemporaries. It is entitled to the rare praise that being of no style it yet has style, and it is a sober and at the same time a vigorous and individual piece of work.

Two of the simpler and older-fashioned Newport cottages of about this same date, early in the seventh decade, are very well worth notice, that built for Colonel Waring and that built for Mr. Appleton. The former is as unpretentious and as successful as possible, and remains almost a model in its kind of a sea-side cottage. The mansard here, treated as the lower and steeper slope of a gambrel roof, becomes not merely inoffensive, but very positively attractive, while the introduction and the treatment of the central gable leaves for its purpose nothing to be desired. It supplies a dominating feature to the composition, and imparts quite sufficient variety without at all disturbing the easy and homely appearance which is the charm of the dwelling. The Doric porch, of which the detail is now hidden by vines, becomes all the more quaint and amusing by its very academic incongruity with the timbered gable over it.

The other cottage is of a quite different aspect. It is more sprightly, more fantastic, less homely, less easy, more evidently intended as a summer resort and less eligible as a home. It is more consciously clever, and in revenge it does not give the same sense of repose. But about the cleverness there can be no doubt. The fronts are composed, each by itself, and they are well united. The gay and fantastic aspect given to it by the multiplicity of forms and features is enhanced by the multiplicity of materials. The ground story is of rubble-stone, the upper is covered with slate laid in colored patterns, while the roof is shingled. It dates itself much more accurately than the cottage of Colonel Waring, which might be either much earlier or much later, and to say that is perhaps to say that it is an example of a bygone fashion. But it is successful enough in its own kind to make it worth preserving, not only as a specimen or a relic, but as a piece of cottage-architecture, and no judicious

visitor to the Newport that now is could wish it away.

This leads me to remark upon an unpretentious work in Newport to which its author has very likely not attached any importance, either when he was engaged upon it or since, but which is nevertheless very useful and extremely well worth doing. I mean a row of two-story shops, in brickwork, half-timbered, on one side of the Casino, now counterbalanced by a row of brick shops on the other side. Newport is almost the only exception to the rule that our watering-places are vulgarized by their shopping streets, and that the flimsiness and contemptibleness of the commercial building go far to nullify whatever expression of refinement and art the cottages may impart to the place. For this reason, these shops in Newport, though merely decorous and appropriate, are highly exemplary.

In some of the architect's city dwellings of this period the designer seems to have put a strong constraint upon himself to repress the exuberance with which those we have already mentioned may fairly be charged, and to have aimed at a conventional decorum, which has been attained, but only at some sacrifice of animation, and indeed of individuality. Nobody would suppose, for example, that the houses built for Dr. Williams, in Boston, had the same authorship with the houses of Mr. Martin Brimmer, or the houses built for Mr. Bronson in Madison avenue with the earlier houses in Park avenue. Of the former houses indeed the passer would scarcely be moved to inquire the name of the architect, so respectable and unremarkable they are. The latter are more positive, and are indeed quite typical expressions of a "comfortable bourgeoisie" in domestic architecture which so often expresses qualities much less eligible.

The Lenox Library is almost alone among Mr. Hunt's buildings of this period in presenting a solution of an important architectural problem, which is at once academic and individual, and which combines animation with dignity. It is very simple in composition, and it is in monochrome; it evinces no straining for novelty or for effect, and yet it

has a distinct physiognomy of its own. Its massiveness is in fact very unusual in our building, and it is so artistically accentuated as to seem even more unusual. The relation of the solid wings to the more open recessed centre is very happy, and so is the treatment both of wings and centre, the single opening at the centre in each story of the wings, the relation of these openings to the flanking walls and to each other, enhanced by emphatic exhibition of the masonic structure and of the thickness of the walls. The centre is equally felicitous in the adjustment of its three stages, the solid basement with the lofty entrance, the triple arcade above, and the crowning attic with its pairs of openings. The net result of the designer's dispositions is to give the building an impression of "scale," in which it was almost alone in New York or in the country at the time of its erection, and has had very few successful rivals since; the sense of largeness and liberality, without which monumental dignity is out of the question. Doubtless the architect was fortunate in his problem and his client, but we have seen equal opportunities frittered away too often not to offer him very cordial congratulations upon seizing his opportunity and making the very utmost use of it, insomuch that he has produced perhaps the most monumental public building in New York—certainly one of the chief ornaments and architectural possessions of the city.

One building of the early seventies that does not easily fall within classification with respect to its purpose is yet too individual and too characteristic to be passed over. This is the lodge of the Scroll and Key at New Haven, devoted to the celebration of Eleusinian undergraduate mysteries, as one might without much difficulty infer from its architecture. It is, as its purpose required, a study in blank wall, how it is lighted and how it is ventilated being among the mysteries which it proclaims. How it is even entered is left as much to the imagination as could be done without the provision of a tunnel, at the remote other end of which the initiate might dive into a manhole and disap-



New Haven, Conn.

SCROLL AND KEY CLUB.

pear from view. The Moors in Spain devised an architecture of which the exterior was almost exclusively dead-wall, and the Spanish-Moorish naturally furnished the precedent for so much, or rather so little, of decorative detail as the exterior shows, only the columns that bear the stilted arches and the enriched band at the impost. Otherwise, the architecture is but the exposition of the structure of a cube of masonry, a very clear exposition by reason of the application of strengthening piers, and the emphasis given the bonding by the use of narrow alternate courses of a darker tint than that of

the wall field. These devices give a very satisfactory assurance of stability. For the rest, the design imparts to the building a certain comic air of "advertising mystery and inviting speculation" that is intensely appropriate.

Of purely monumental work, that is to say of erections which serve no utilitarian purpose, but are intended to preserve the memories of men or of events, I suppose Mr. Hunt has had at least as much to do as any other American architect. "Monumental work," in the marble-cutter's sense of mortuary architecture, is of course only a part of this, but in this limited

sense also he has done his full share of it. It will not be disputed that here at least the training of the schools is an unmixed advantage. The crowd of precedents with which his schooling supplies the student may positively encumber him when he is engaged upon buildings that are to serve actual physical needs. It is not difficult to recall instances in which the architect's memory has embarrassed his invention by supplying him with a less eligible solution of his problem than he might have attained if he had remembered less and thought more. The motive in works of utility is supplied by the need. In purely monumental work there is no physical basis of architectural expression. A tomb, indeed, suggests in some degree its own treatment in so far as it is merely a safe and inviolable repository, and to this may be added by the architect the suggestion that it is also a shrine. Of the former class, in Mr. Hunt's work are the Delano and Hoe tombs and the Vanderbilt mausoleum, works carried out upon various scales of magnitude and cost, but in all which the primary notion is that of inviolability. The Delano tomb is a simple but very successful example of this type, an excavation in a hill-side, with a closure and revetement of massive masonry, almost devoid of ornament, owing its effect to the size and disposition of the parts, while the suggestion that it is also a place of pilgrimage is added by the curving seat on either side.

A more ambitious and elaborate work, one of the most noteworthy, indeed, of our architect's achievements in purely monumental design, is the Belmont tomb, a beautiful work and a work so purely classic in spirit as, I confess, to give me pause over the conclusion at which I had arrived, that classic design is with him a result of academic training, and by no means of "the strong propensity of nature." It is not a reproduction, for the precedent for the disposition, to say nothing of the structure, does not exist in classic times. Yet the simplicity, the purity, the tranquillity of the work connote exactly what we mean by classic, and the round arch is introduced into a

design essentially Grecian in spirit as well as in letter, without jar or sense of incongruity. Nothing could well be happier than the disposition or than the detail taken by itself. The defect which estops the work from attaining perfection in its kind is a defect not usual with its author, a defect of scale. A careful inspection will reveal, I think, that the detail is pretty uniformly, excepting the impost mouldings of the arch and the uppermost mouldings of the exedra, too large for the mass, which it thus tends to dwarf and directs attention too much to itself. But in all our essays in that classic design which in proportion to its simplicity is intolerant of imperfection, how many can bear comparison with this?

In monumental work in association with sculpture Mr. Hunt has also been as frequently employed as any other American architect. As a rule the designing of pedestals is as thankless as it is difficult. For the merit of a pedestal is not to be noticeable, to count simply as a part of the statue, and to direct no attention to itself. As soon as one begins to observe it on its own account, he has a right to suspect that it is defective, or, which comes to the same thing, excessive. The designer of pedestals is in the position which Dr. Johnson assigns to the lexicographer—all other artists may aspire to praise, but he can hope only to escape reproach. So it is not desirable to illustrate or to consider in detail the architectural accessories which Mr. Hunt has designed for statues, useful and valuable as a consideration of them may be to designers confronted with similar problems. Among them are the Seventh Regiment monument, the Pilgrim monument and the Dodge monument in New York, this latter an especially good and effective example of the manner in which dignity and detachment may be given to a portrait statue in a street by its architectural accessories; the Beecher monument in Brooklyn and the Garfield monument in Washington.

The pedestal of the Liberty monument in New York Harbor is taken by its colossal scale quite out of the cate-



BELMONT TOMB.

gory we have just been considering. It is impossible to overlook, or to avoid looking at, the huge mass of masonry which serves as a substructure for the huge figure. In this instance not alone the architect, but the untrained observer, must take notice of the pedestal as something more than an accessory of the figure, so great and lofty is the mass required to give to the statue, as was the sculptor's evident intention, the same dominating relation to the upper bay of New York that is borne by a statue of merely heroic size to the plaza in which it stands. This has been so successfully done that one is apt not to think of the difficulties until they are brought to his attention, but these were in fact very considerable. To avoid on the one hand making the pedestal a mere brute mass and to avoid on the other such an elaboration as should make it appear an independent work to be looked at for its own sake—these

were respectively the Scylla and Charybdis between which and clear of which the designer had to steer. It was fortunate that the island was already occupied by a fortification which might serve as an ample base for the pedestal, but it was not luck that gave the architect the perception of the value of this base and enabled him to make it an integral part of the composition. In fact it is the plinth of a structure of which the whole pedestal is the die and the statue the capital, while the pedestal has also its own triple division, and well avoids the extremes of crudity and of over-elaboration. Its proportions are not without felicity; its ornament, sparing as it is, yet suffices to emphasize the structure. It is in the right place and it helps to give the scale. In fact it is in this matter of scale that the monument is most successful, and the devices introduced to this end, though



STATUE OF LIBERTY.

New York Harbor.

Pedestal and base designed by R. M. Hunt.

unobtrusive, are indispensably necessary, the chief of them being the openings in the two stages of the pedestal, of which the lower will be still more effective and the connection between the base and the shaft of the pedestal will be sensibly more organic when the terraced stairways contemplated in the design come to be added.

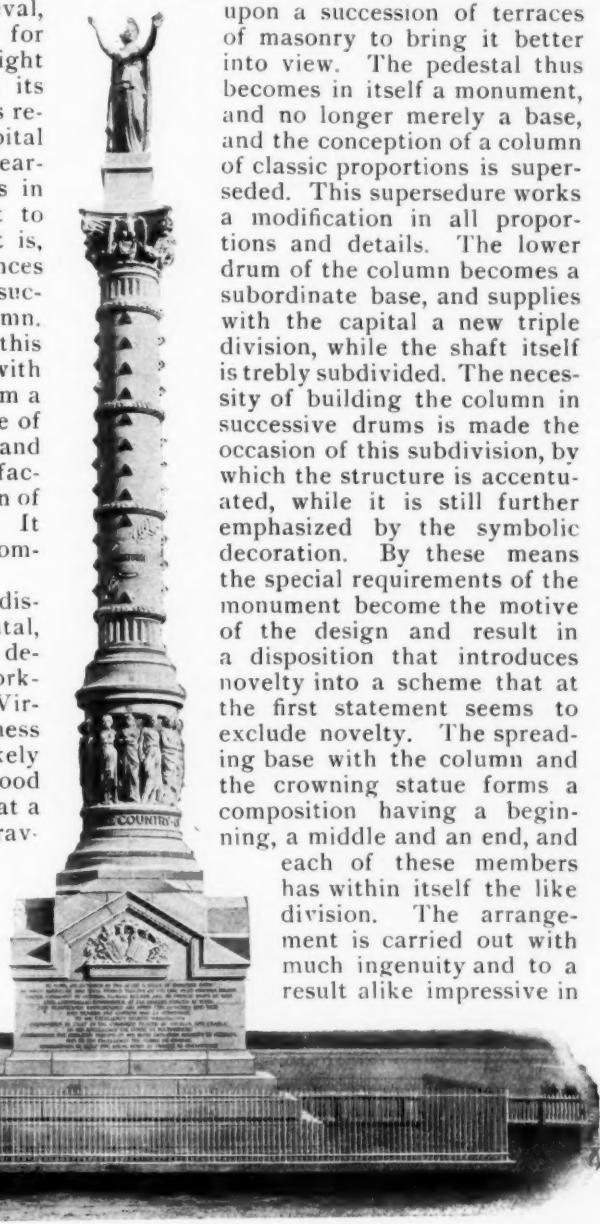
The Wadsworth fountain at Geneseo is one of the relaxations of architectural practice which do not often fall to

practitioners capable of enjoying them. They are ostensibly and professedly "amusing," and if they afford entertainment to the cultivated passer their purpose is accomplished. From this point of view the fountain is distinctly successful. It is a column, academically Gothic in design, from the griffes of the base to the mouldings of the abacus, and its Gothicism is enhanced by the application of the iron band, which has the same effect as the moulded

fillet which the mediæval designers and the English revivalists introduced so freely to mark the junction of the drums in columns that were not monolithic. The culminating bear has no local or heraldic significance, I believe, but it was a happy thought to introduce him. In fact the column as we know it, classic or mediæval, has been evolved evidently for the purpose of bearing a weight of much greater area than its own, and it is to express this relation that a spreading capital exists. A detached column, bearing no load or a load less in diameter than itself, is apt to look irrational, as in fact it is, and there are not many instances in which a statue has been successfully set upon a column. The spreading haunches of this beast, and the firmness with which he is planted, make him a distinct exception to the rule of failure, while his attitude and indeed his existence are satisfactorily explained by the lantern of which he upholds the staff. It is a singularly happy and complete little work.

Not at all playful, but distinctly and severely monumental, is another crowned column designed by Mr. Hunt, the Yorktown monument. The low Virginian shore and the humbleness of the buildings erected or likely to be erected in the neighborhood of the site made it certain that a column here even of not extravagant dimensions would be a landmark and a dominant object in the landscape. The motive for the design was in great part supplied by the necessity of exhibit-

ing a long inscription so that it should be legible as far as the detail of the monument was apprehensible. This requirement naturally led to the exaggeration of the base beyond what would have been fit, if it had been merely the substructure of the shaft, and to the raising of the inscribed die upon a succession of terraces of masonry to bring it better into view. The pedestal thus becomes in itself a monument, and no longer merely a base, and the conception of a column of classic proportions is superseded. This supersedure works a modification in all proportions and details. The lower drum of the column becomes a subordinate base, and supplies with the capital a new triple division, while the shaft itself is trebly subdivided. The necessity of building the column in successive drums is made the occasion of this subdivision, by which the structure is accentuated, while it is still further emphasized by the symbolic decoration. By these means the special requirements of the monument become the motive of the design and result in a disposition that introduces novelty into a scheme that at the first statement seems to exclude novelty. The spreading base with the column and the crowning statue forms a composition having a beginning, a middle and an end, and each of these members has within itself the like division. The arrangement is carried out with much ingenuity and to a result alike impressive in



THE YORKTOWN MONUMENT.

the mass and interesting in detail. This detail is not classical, but distinctly modern, and the treatment of it evinces a sure and practiced hand. It is very successful in scale, the detail taking its place in execution apparently quite according to its author's intention, while such of it as is symbolical shows spirit and invention as well as careful adjustment, as witness especially the modelling of the capital with its eagle.

The most familiar of all Mr. Hunt's works, that by which he is known to the greatest number of his countrymen, is undoubtedly the Administration building of the Columbian Exposition, and this clearly comes within the classification of monumental works. The utilitarian requirements of the building were so simple and compared with the whole so unimportant, as scarcely to be worth considering in a judgment of the whole. They were accommodated in the four pavilions that architecturally formed the base of the monument, and they interfered with its architecture only to the extent that, if they had had no practical uses, they would doubtless have been made more solid than it was in fact permissible to make them, and thus have given more completely the sense of the ultimate abutments of the structure. Above and within these the building was purely a monument. It had indeed one or two adventitious advantages. It occupied precisely the most important site upon the grounds, that which closed the vista of the Court of Honor in the approach from the lake, which was the approach chosen for their first visit by all visitors who were well advised, and were wisely provident of their first impressions. But this advantage would have been a drawback if the building had not been so triumphantly successful for its purpose, filled its place so perfectly, and been so conspicuously worthy of its predominance. The fierce light that beat upon the central and culminating point of such an architectural display as was afforded by the Court of Honor would mercilessly have exposed the defects of a building less successfully designed. A much more substantial advantage was that the Administration Building was the only one of the great plaster pal-

aces to which the exigencies of the occasion allowed an interior. All the other palatial architecture of the exterior was a mere and manifest mask to a construction of engineering work and the illusion of the spectator was suddenly snatched from him at the portal. Only in the vast arched trusses of the Building of Manufactures was the engineering construction so monumenally handled as to give the spectator an equally impressive reality for his lost illusion. But in the Administration Building the illusion was maintained, and the interior was the architectural counterpart of the exterior. This was undoubtedly a great advantage, and every one of the millions of visitors to the Fair who passed under the dome is ready to testify that the most was made of it. Indeed, there is no drawback to the complete success of the monument except what was enforced by the utilitarian exigencies of the angular and basic pavilions, and the somewhat awkward tristylar ordinance of these, which was perhaps entailed by the necessity of abundant light for what architecturally should be the solidest part of the design. But above the first cornice, criticism can be only praise. Nothing could well be happier in mass and in detail than the design of the superstructure. The quadrangular colonnade, decisively truncated at the angles, and reinforced here by powerful masses, still further punctuated by the crowning groups of statuary, is highly impressive in itself and yet more impressive as the base of the dome, with its powerful and emphatic ribs, a dome really soaring like that of Brunelleschi, and lightly poised upon its low, plain, eight-sided drum, "a noble, festal, glittering, shapely bulk in white and gold," worthy of its predominance as the central feature of the most imposing architectural display that has ever been seen on this side of the ocean, and to which it is hard to recall a parallel, either in permanent or occasional architecture, upon the other; in its kind not only the crowning achievement of its architect, but one of the chief triumphs of modern academic architecture.

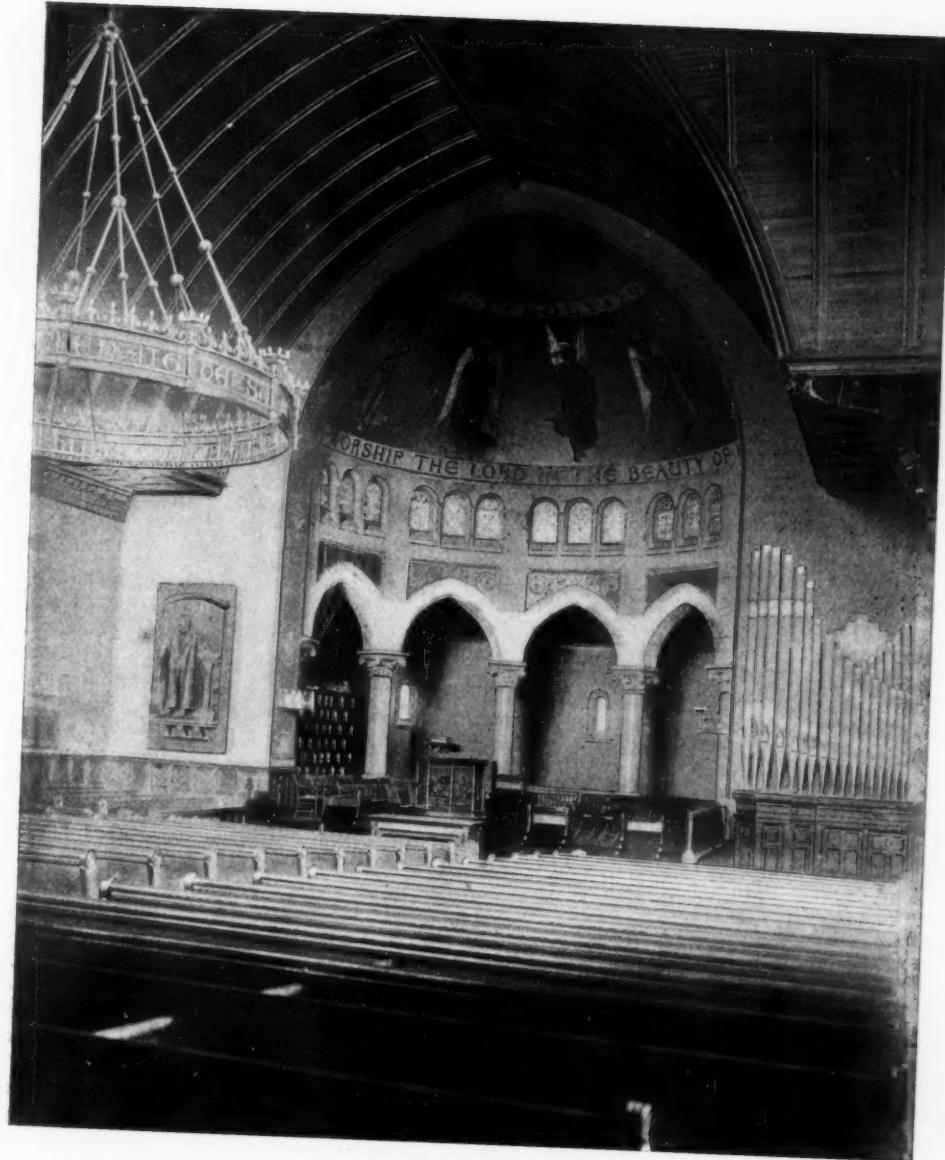


World's Fair, Chicago.
ADMINISTRATION BUILDING.

Considering the extent and variety of Mr. Hunt's practice, and the fact that even at the beginning of his career, when an architect was held to be rather a superfluity in private building, the necessity of having an architect for a church was generally recognized, it seems rather curious that he should have done so little ecclesiastical work. He has done comparatively so little, indeed, that many who think themselves familiar with his work are unaware that he has done any churches. The chapel of the Presbyterian Hospital and the chapel of the Divinity School at Yale are excursions in a Gothic so individually treated as to lose almost completely its ecclesiastical associations. Mr. Hunt has indeed written in favor of the Byzantine type as more eligible than mediæval models for the uses of a modern Protestant church; and it is undeniable that this view finds some support, if not in the great domed structures which we associate with the name, in the smaller basilican churches of Syria and Asia Minor, our first real knowledge of which we owe to the French researches made in our own time. It seems to have been under the influence of this view that Mr. Hunt prepared his interesting design for Trinity Church, Boston, some twenty years ago, which distinctly in its detail, and to some extent in its arrangement, follows the Byzantine model; but it was probably too wide a departure from current notions of ecclesiastical architecture to have stood a fair chance of acceptance, even if Mr. Richardson's design, subsequently executed with such success, had not been prepared. The Marquand chapel, at Princeton, conforms much more closely in its exterior to the accepted type, but in its exterior it cannot be called successful. The scheme of the front—a stark, massive, unbroken campanile, surmounted by a light and open belfry, and flanked by a gabled front with a triple porch in the plane of the tower and a triple window in the recessed wall above, promises a more effective result than is in fact attained. The relation of the square shaft to its crowning member is not harmonious, nor is the design of the belfry itself

fortunate; and the contrast between the solidity of the tower and the openness of the adjoining front is impaired by the great and unrelieved mass of the gable. The porch is itself an effective and picturesque feature, but it does not suffice to redeem the front. The interior, however, is distinctly one of its author's successes, and in spirit, and often in letter, it reverts to Byzantine models. The apse is shallow, as beseems the simple Presbyterian worship of which it is the scene, and from which the notion of an altar is excluded, but it is admirably proportioned and detailed, and in spite of the pointed arches and the Gothic treatment of the capitals, recalls the Byzantine half-domed apse, to which it owes one of its most successful features, the series of low openings in the drum through which the interior is lighted. It is only the suggestion that it does, for the working out of the suggestion is as original as it is successful. The scheme of decoration of the ceiling also suggests Byzantine models, and of their availability as employed here there can be no dispute. The apse is a dignified, harmonious and impressive design, and the whole interior is noteworthy, especially the vigorous and ingenious treatment of the timber-work of the roof-construction.

A more successful ecclesiastical exterior is that of St. Mark's, Islip, which is not merely a church-building, but a parochial "plant," including a rectory and the dependencies of the church, combined into a very picturesque and effective group. In this the style is suggested by the material, and is distinctly Scandinavian in character. The most conspicuous badge of its architectural origin is the unmistakably Norwegian treatment and termination of the gables, but in other and more important though less obvious points a discriminating admiration for the Norse timberwork is equally discernible. The freedom and spirit of the style made it a very congenial medium for the architect, and the church, and indeed the whole group of which it forms the chief member bears evidence of being a thoroughly enjoyed piece of work. It has all the sprightliness of his early



Princeton, N. J.

INTERIOR OF THE MARQUAND CHAPEL.



Islip, L. I.

EAST END, ST. MARK'S CHURCH,

(Rectory at the left).

domestic work at Newport, while showing a far riper mastery both of composition and detail. Note especially the cleverness and originality of the treatment of the transepts, of the gable of the nave, and of the protruding and spreading porch. In invention, freedom and picturesqueness I know of no work of its author's superior to this.

To appreciate the buildings designed by Mr. Hunt for West Point, one must have known West Point before they were built. The old buildings of the post, done by military engineers, were fairly describable as "barracks," with all the order and solidity, and also with all the hardness and ugliness that that term denotes, without regard to their destination. Being called upon to add to their number an academic building and a gymnasium, Mr. Hunt so discharged his task as to dignify and embellish the whole group to which his works were added. It would have been easy, and to most architects it would have been tempting to put the old buildings to an open shame, and to compel attention to the superiority and the difference of the newer. This he care-

fully abstained from doing. He conformed, so far as conformity was possible, to what he found, retaining the conventions of military architecture, the machicolated cornice, and the crenellated parapet, but modifying the disposition of the masses so as to give weight and force where they are aesthetically needful, and to convert mere squareness and symmetry and substantiality into massiveness and dignity. The rough masonry of his buildings shows very little of express ornament. The whole force of the design resides in the artful disposition of the masses, and in the straightforward and structural character of the treatment. The most commendable point in the design, it may be said, is that the designer has produced an artistic result, while deviating so little from what he found, and conforming to it so much, and instead of undertaking the facile feat of putting the work of his predecessors out of countenance, has chosen the harder part of keeping them in countenance. In this view the academic building and the gymnasium at West Point are highly exemplary, as in



Islip, L. I.

CHANCEL AND SOUTH TRANSEPT, ST. MARK'S CHURCH.

any view they are very successful performances.

The Fogg Museum, the latest addition to the architecture of Harvard, bears testimony to the extent and intensity of the present tendency to revert to pure classic. The building may be and indeed has been criticised for its failure to conform to its architectural surroundings, and it is precisely this conformity, as exemplified in his buildings for the Military Academy, that we have just been praising. Of the non-conformity here there can be no question. The photographs of the Museum bear witness to it, in showing above and behind it in one view the

tower of the Memorial Hall, in a very active and militant phase of Victorian Gothic, and in the other a steeple with which the new building has as little congruity. But the conditions were by no means the same in the two cases. The building of West Point, such as it was, was all of a piece, whereas in Harvard, what was there to which the designer of a new building could conform? The college-yard of Harvard, like those of all our older seats of learning which have grown and not like some of the newer been made at a single stroke, exhibits a compendious history of American architecture from the time of its foundation. Colonial

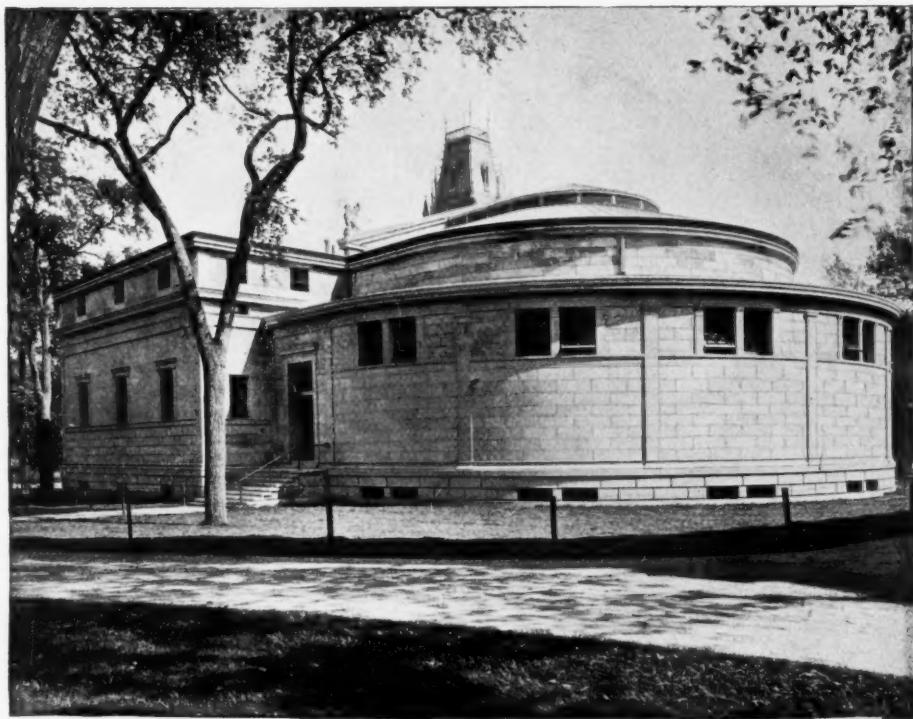


Cambridge, Mass.

FOGG MUSEUM.

both in the vernacular and in the educated version of Bulfinch, the old Greek revival, the Gothic revival, the Richardsonian Romanesque, nay, Queen Anne itself, all these phases are illustrated. It was quite out of the question that the designer of a single new building should be able either to give unity to this miscellany, or to give the effect of preponderance to one of the styles by which his building was surrounded. He really had no choice but to design it for its own sake and leave it to stand on its own merits; and these are very considerable. With such surroundings, it may well have seemed to him that his most legitimate aim was for the utmost purity, the utmost simplicity and the utmost quietude; and he may very well have considered that these qualities could be best attained by a design in strict classic, even without reference to its present vogue. Doubtless the building does possess these qualities, is first pure and then peaceable. A recessed centre, between

two projecting wings, prefacing a classic theatre—the problem is here reduced to its simplest expression. The openings are so designed and so placed as rather to emphasize than to interrupt the expanse of wall, the proportions, both lateral and vertical, are just and felicitous, and the detail is of course pure. The theatre is indicated from the front by the low gable with its acroterium, in a manner imperfectly shown by the engraving. In another important respect the engraving fails to do the building justice. The order, although engaged, has much more force, value and even detachment in fact than it appears to have. Nevertheless, and although the defect of scale which I have noted in the Belmont tomb is avoided here, I cannot think this upon the whole so successful an essay in classic, perhaps for the reason that it seems to be more consciously and deliberately such an essay. The other has the air of a work in which the idea controlled the execution, and the designer



Cambridge, Mass.

FOGG MUSEUM — REAR VIEW.

composed freely in a style in which he was entirely at home, without taking much thought for the style; this rather of an academic exercise, a learned and competent exercise, no doubt, but one in which academic correctness, the intention to produce an "example" was more consciously present.

It is a familiar fact that in architecture experience counts for a great deal, for more, perhaps, than in any other art. Nor is the reason of this far to seek. In any work of art the perfection of the expression is a larger element of artistic success than the value of the idea. The novice, or for that matter the layman, may have "happy thoughts" which would be of value to a skilled workman, but are of little or no use to the owner. When he tries to body them forth it is then the inexpert discovers that the embodiment is a matter of slowly and toilsomely acquired skill. The difficulty in architecture is peculiarly great, because here the artist can never see his work

until it is irrevocably done. He has to imagine at every step in his notation of an architectural idea, not how his drawing looks on paper, but how the object imagined and not seen will look in the sunlight and at a given distance. He never sees the thing itself until it is too late to correct it. Even a designer of long experience finds that he is continually deceiving himself as to the effect of his dispositions, that the features he draws, when they come to be built, are larger or smaller, more or less emphatic, more or less conspicuous than he meant them to appear. The designer who has never built anything is hopelessly at a loss. Hence it has been said that no architect ever learned detail except through his own mistakes. No other artist is under a like disability to the same extent—no other, unless it be the composer, whose score bears much the same relation to his work of art as the architect's drawings to his, and who has to imagine, as he jots down notes on paper, how the succes-

sion and combination of them will sound in the orchestra.

This consideration may be incidentally commended to the various lay projectors of competitions, who commonly go in fear lest by confining their competition to architects of standing and experience they may be excluding the unknown genius who has done nothing. There is no such person, and no complete exception to the rule that first essays are failures. Skill in architectural design is a plant of slow growth.

most conspicuous of them plain that the architect has not been hampered or compelled to curtail his design for want of money. The designs have merely been adequately executed. If one imagines that the advance is not strictly an artistic advance, let him compare the houses of moderate cost of this latest period with their predecessors. There are two of these, as it happens, among his recent works at Newport, one dating from 1883 and the other from 1891. Neither of them



Newport, R. I.

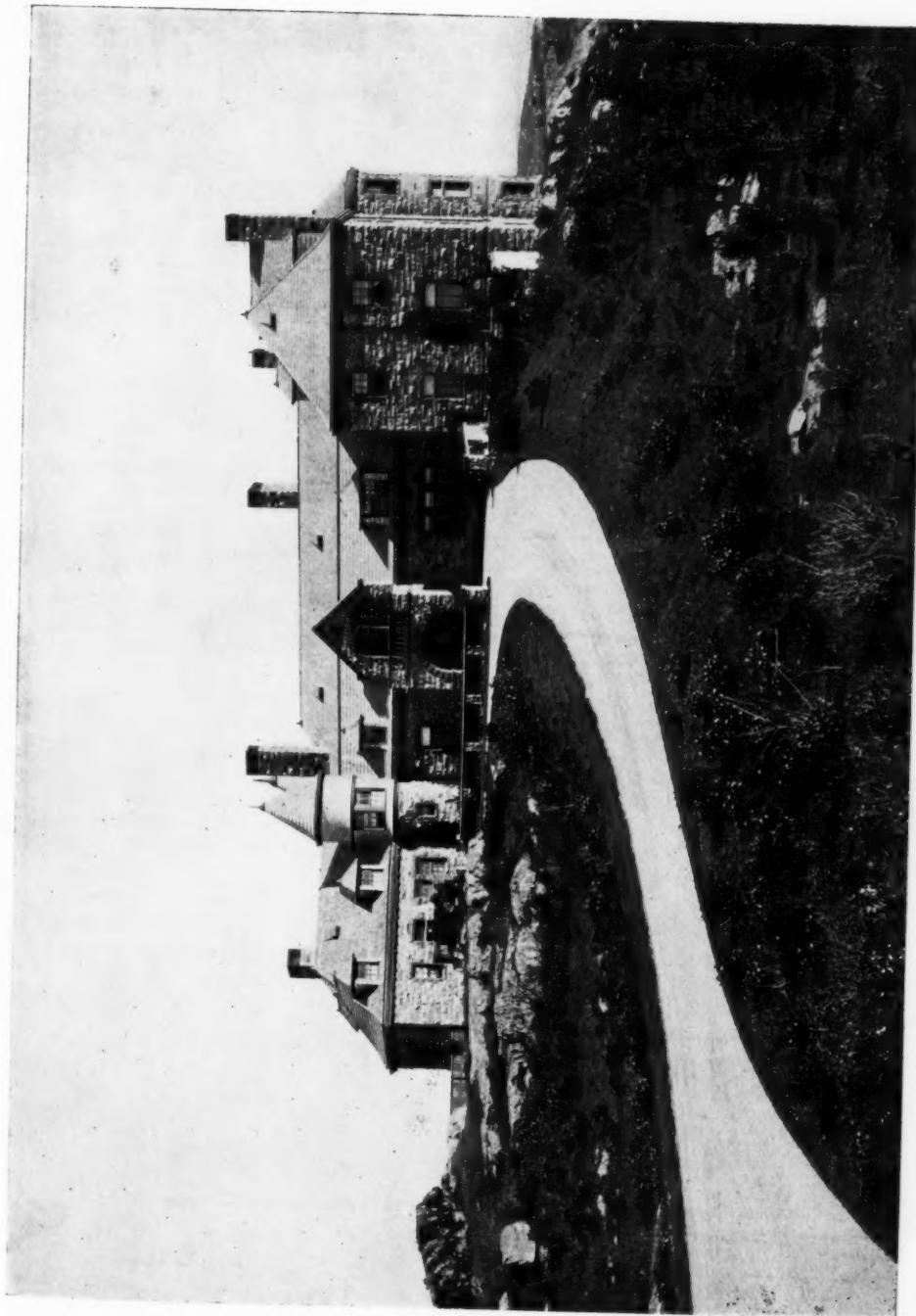
RESIDENCE OF PROFESSOR SHIELDS.

Our present subject affords a very interesting exemplification of this truth. For, it will scarcely be disputed that Mr. Hunt's most brilliant successes have been won within the last fifteen years, and since the artist reached his fiftieth year. He has within this period been employed mainly in domestic work, and the increase in the costliness of private houses must be allowed to count for something. While not one of his later houses can fairly be charged with making an effect of mere ostentation and prodigality, yet it is in the

has palatial pretensions, and either, so far as scale and costliness go, are representative rather of the Newport of the seventies than of the Newport of the nineties. It is strictly in artistic success that the advance is shown. The cottage of Professor Shields is not a palace but a cottage; the bungalow of Mr. Busk is a bungalow and not a palace, and each is a very successful piece of architecture. The gist of the design in the former is the projected centre of each of the principal fronts, crowned by a hipped gable, making

Newport, R. I.

THE RESIDENCE OF J. R. BUSK, ESQ.





Newport, R. I.

RESIDENCE OF J. R. BUSK, ESQ.

two features of equal size and importance; a perilous project when it is stated in words, for it seems to promise an irreconcilable competition. It has been so successfully carried out that one quite forgets that there was anything temerarious in the scheme. The reconciliation is effected by the carrying up of the angle between the two fronts into a loggia, of which the roof furnishes the dominant feature of the composition, and unites at once and subordinates the equal fronts. The effect of this disposition is enhanced by the detail. The stone basement is carried through the second story in one front, and the sense of a building in layers thus escaped, while the decoration is everywhere a development of the construction, the architecture a straightforward expression of function and an idiomatic treatment of the material. The only drawback to the complete success of the work in execution is the unfortunate and obtrusive crudity of tint of the orange tiling with which the upper walls are hung. As a matter of design, however, the cottage has lost nothing of the ingenuity and spirit of the author's early work in the same kind and it has gained the unity and repose that that was apt to lack.

Even happier is the bungalow in rough masonry built for Mr. Busk. This is a sea-side cottage reduced to its simplest expression and gaining greatly in force from the reduction. Nothing could be simpler or more fortunate than the composition of the principal front, the unbroken roof projected as a verandah, the low flanking towers and the low wings, and the other front is scarcely less felicitous. This reduction of a front to a feature was the process employed by Mr. Richardson in his most successful works, and was the main factor in their success, but in this bungalow the Richardsonian simplicity is attained without the Richardsonian exaggeration. The architecture is in so complete a congruity with the topography that the house seems to be a part and an outgrowth of the landscape in which it is set. There can be no higher praise for a country house than this.

Neither of these, however, is a typical example of the work of Mr. Hunt's riper years. This has been in the main the adaptation to modern and American needs of the French architecture of the sixteenth century, the architecture of the châteaux of the Loire. Called French Renaissance, this architecture is so much less Renaissance than it is French that its chief historical interest is in the demonstration that it makes how hard French Gothic died and how it was a whole century before the indigenous architecture of craftsmanship gave way to the exotic architecture of dilettantism, how little the imported detail for so long affected the native method; while its chief æsthetic interest is in the picturesque and romantic conceptions which refused to be formalized and classified by the influence of the Roman revival in Italy. Certainly there could not have been a happier choice for our subject, nor one through which his nature and his training could have been reconciled and combined to the best results. The first of his works in this kind was the house of Mr. W. K. Vanderbilt in Fifth avenue. It was at once popularly acclaimed as by far the most successful of the four great Vanderbilt houses which were building at the same time, and which had been executed with a regardlessness of expense quite new in our domestic architecture. It was also recognized by the more critical inspectors as a distinct advance for its architect, and a successful new departure at an age when most men shun experimentation and work "after as they have been accustomed." After twelve years one is not inclined to retract or modify his original admiration, in which, therefore, it is plain that novelty had no part. Indeed, there is nothing to be said in qualification of one's admiration, excepting that the treatment of the roofs is less successful than that of the walls, unless one be inclined to maintain that the design is too individual and too pictorial for a town-house, and would go better with more detachment than Fifth avenue affords. Considering the gratitude we owe to the designer for giving us something in Fifth avenue so well



THE RESIDENCE OF ELBRIDGE T. GERRY, ESQ.
5th avenue and 61st street, New York City.

worth looking at, to press this point very hard would be cavilling. That a dwelling with such a wealth of detail should make its chief impression by force of its general design, and that the detail should take its place so well as to make that impression one of power and stateliness rather than of "elegance" is a real and a strictly artistic success.

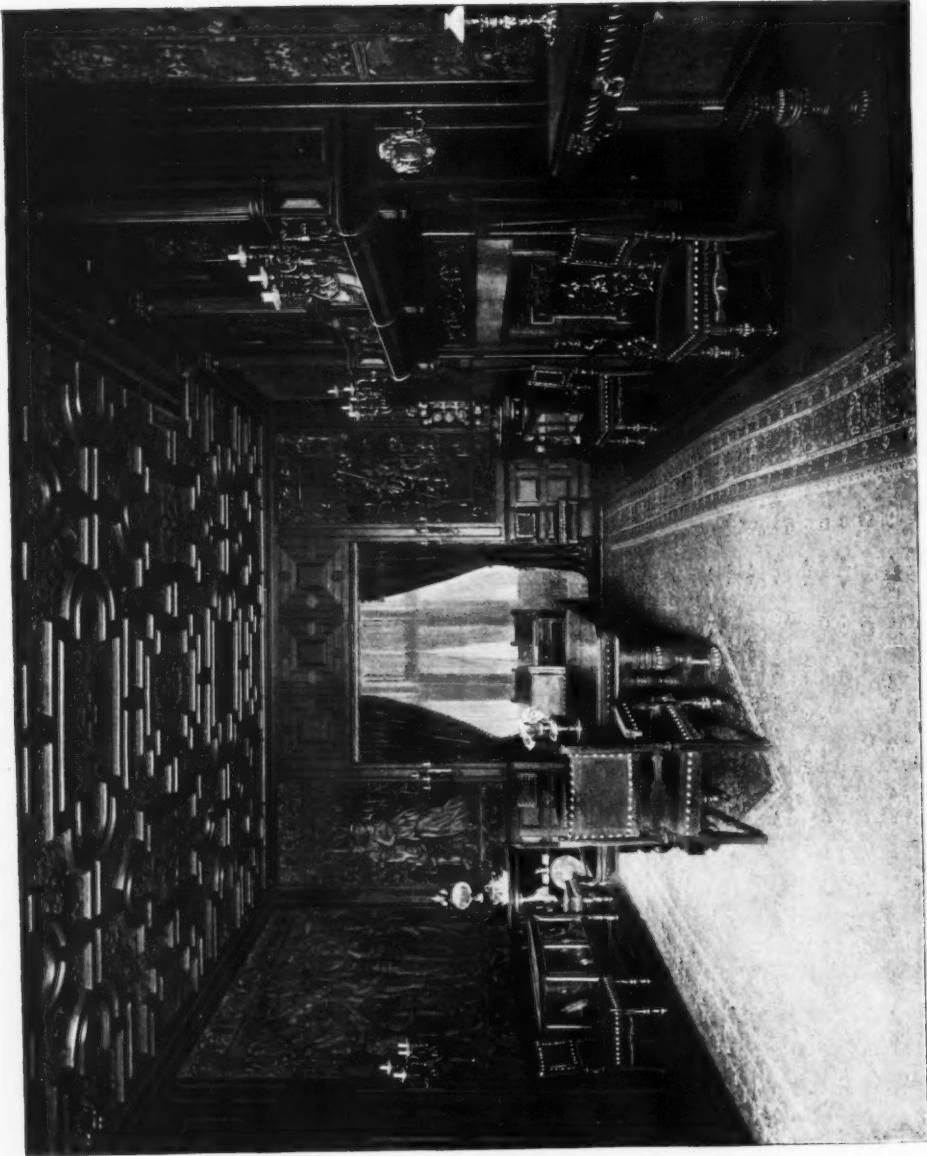
In subsequent works in the same style the artist has seemed to agree with his critics in respect to the comparative weakness of his treatment of his roofs and of the lack of complete unity entailed by the absence of a distinctly dominating feature. The house of Mr. Borden, on the Lake Shore Drive in Chicago, bearing a general resemblance to the house of Mr. Vanderbilt, and like it, executed in a monochrome of gray stone, is more coherent and unified, and so more successful in composition. But to me the latest of Mr. Hunt's town-houses in what we may still call French Renaissance, though here the detail is all Gothic, that built in Fifth avenue for Mr. Gerry is distinctly the most interesting and the most successful. If it is not popularly appreciated at its real worth, the reason is that comparatively few persons take the trouble to look at it from the point of view for which it was designed, the point of view from which our illustration is taken, which is the opposite sidewalk skirting the park. One may pass the Fifth avenue front, and while he cannot but admire the detail, he may observe and resent the lack in this front, not only of formal symmetry, but of balance, without observing, unless he crosses the avenue and takes the right point of view, that this incompleteness of a part is necessary to the completeness of the whole, and to the effect of variety in unity which the designer aimed at and which he has attained. Indeed, in this respect I know no similar work of its author's which equals this, and none of any modern architect that surpasses it. The motive of the composition is the convergence and "pyramidization" of the lines of both wings to the apex of the roof of the tower-like central structure at the angle. The danger of

this scheme is the monotony that would result from a uniform treatment of the fronts on the one hand, and on the other, the lack of unity that would result from a too different treatment. Both dangers have here been foreseen and obviated. The tower upon which the wings converge is a stark and solid mass, pierced with openings that rather emphasize than impair its massiveness. Yet even here monotony is avoided by the differences in the disposition and treatment of the openings in each story, and baldness by the richness and elaboration of the tall dormer that crowns each front. In the wings there are central features of like richness and elaboration, which in effect complement and balance each other, but which are entirely different in form and detail, and which are not even in the same story, that on the avenue front being the loggia in the second story, with its projecting corbelled balcony and its richly cusped elliptical arch, that on the street front the triple group of windows in the third, with their cusped and canopied arches, and the balustraded parapet that connects them. The regularity in effect of the general composition obviates the criticism that this is a country house in town, while the picturesque and romantic detail, scholarly and artistic as it is, is a positive gain. A private dwelling which is so distinctly an ornament to the city is one of the public possessions.

The houses built for Mr. Marquand in Madison avenue in brick, and sandstone, have all the spirit and animation of what we have called Mr. Hunt's staccato style, but subdued into a new repose and keeping. The southern front of this group of houses is stately and dignified; the avenue front, including the two smaller houses, admirably composed and admirably detailed. Our street architecture has nothing better to show in the treatment of the 25-foot front than these examples, in which the houses are just sufficiently individualized without losing the sense of ensemble. One of the most admirable points of the composition is the way in which the slope of the ground makes itself felt in the design of the houses, the line

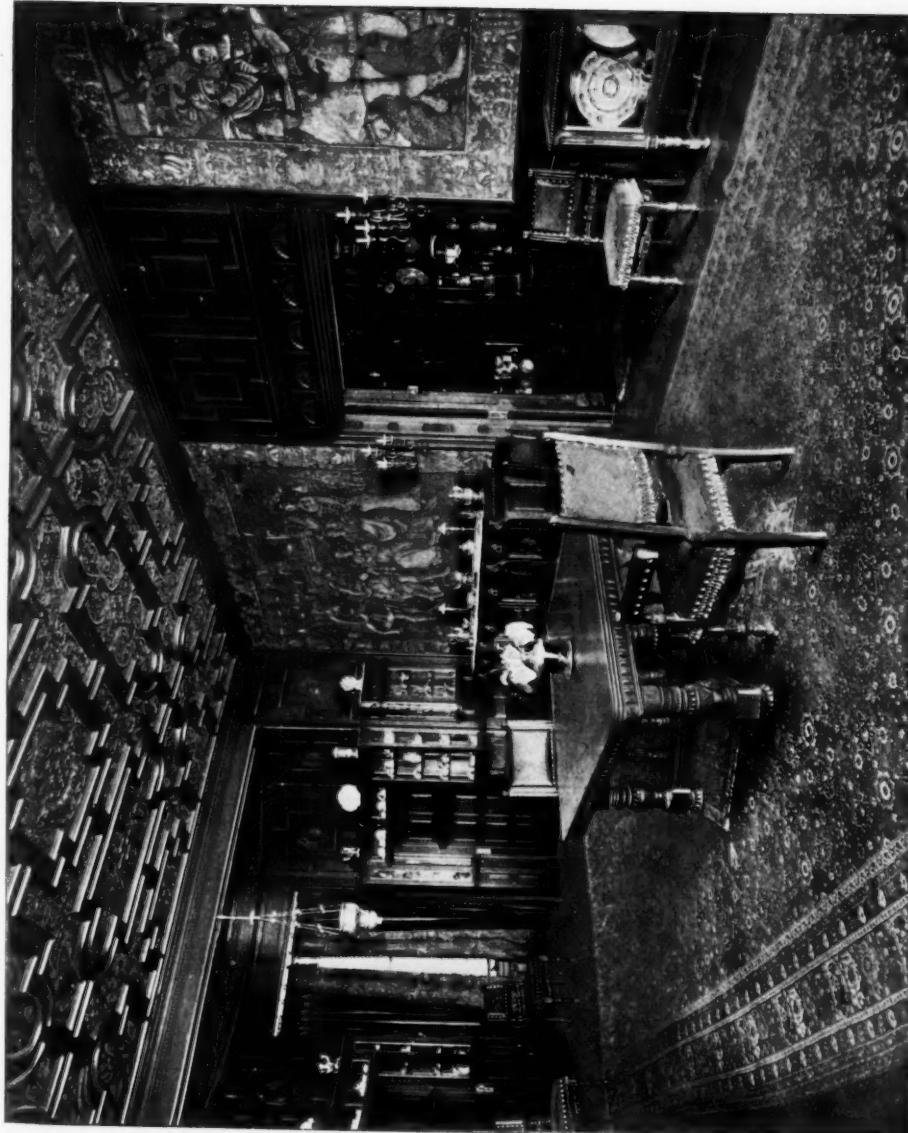
DINING-ROOM IN RESIDENCE OF H. G. MARQUAND, ESQ.

New York City.



New York City.

DINING-ROOM IN RESIDENCE OF H. G. MARQUAND, ESQ.





DINING-ROOM MANTELPIECE IN RESIDENCE OF H. G. MARQUAND, ESQ.
New York City.

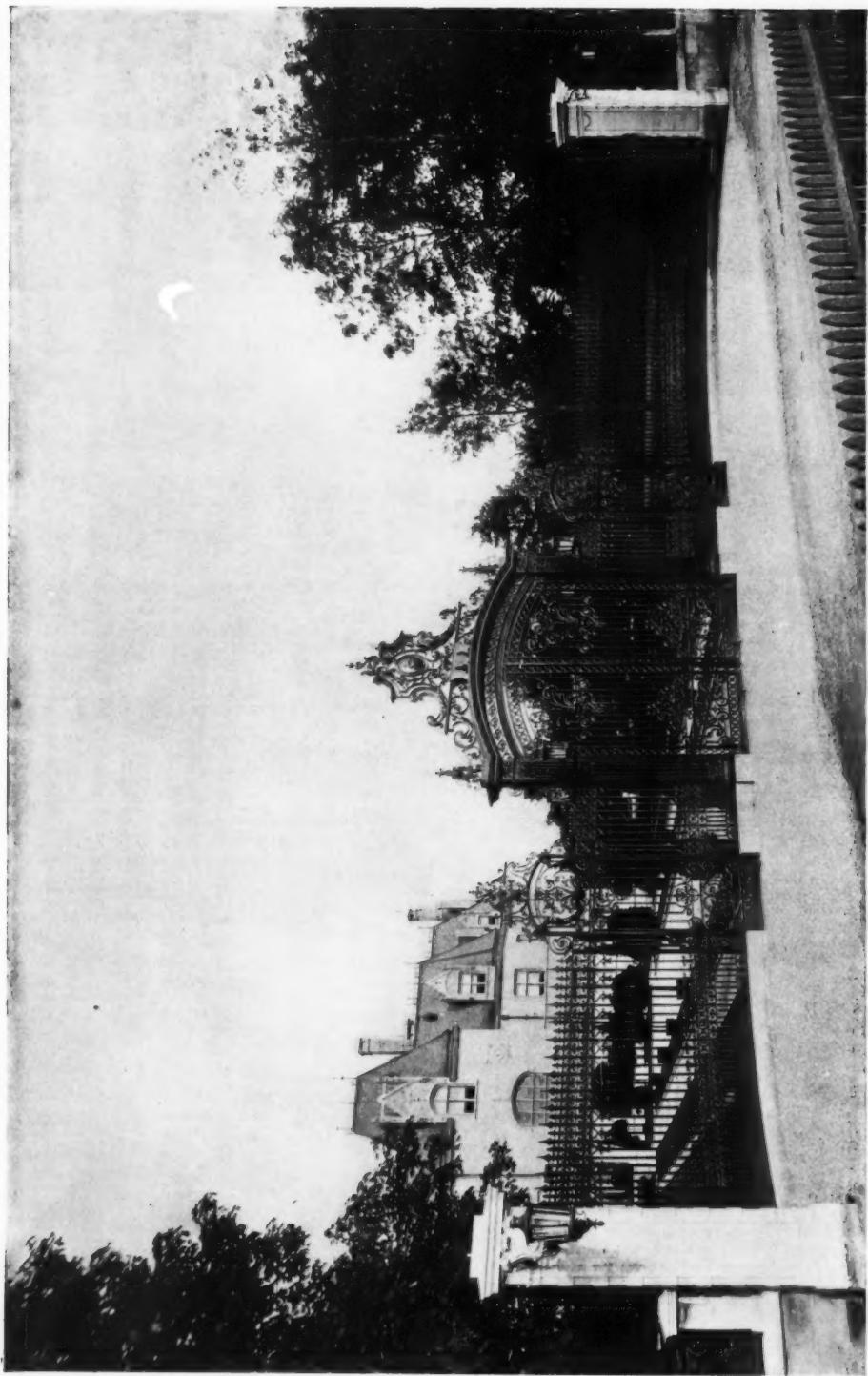
"Ochre Court."

Residence of
OGDEN GOELET, Esq.
Newport, R. I.

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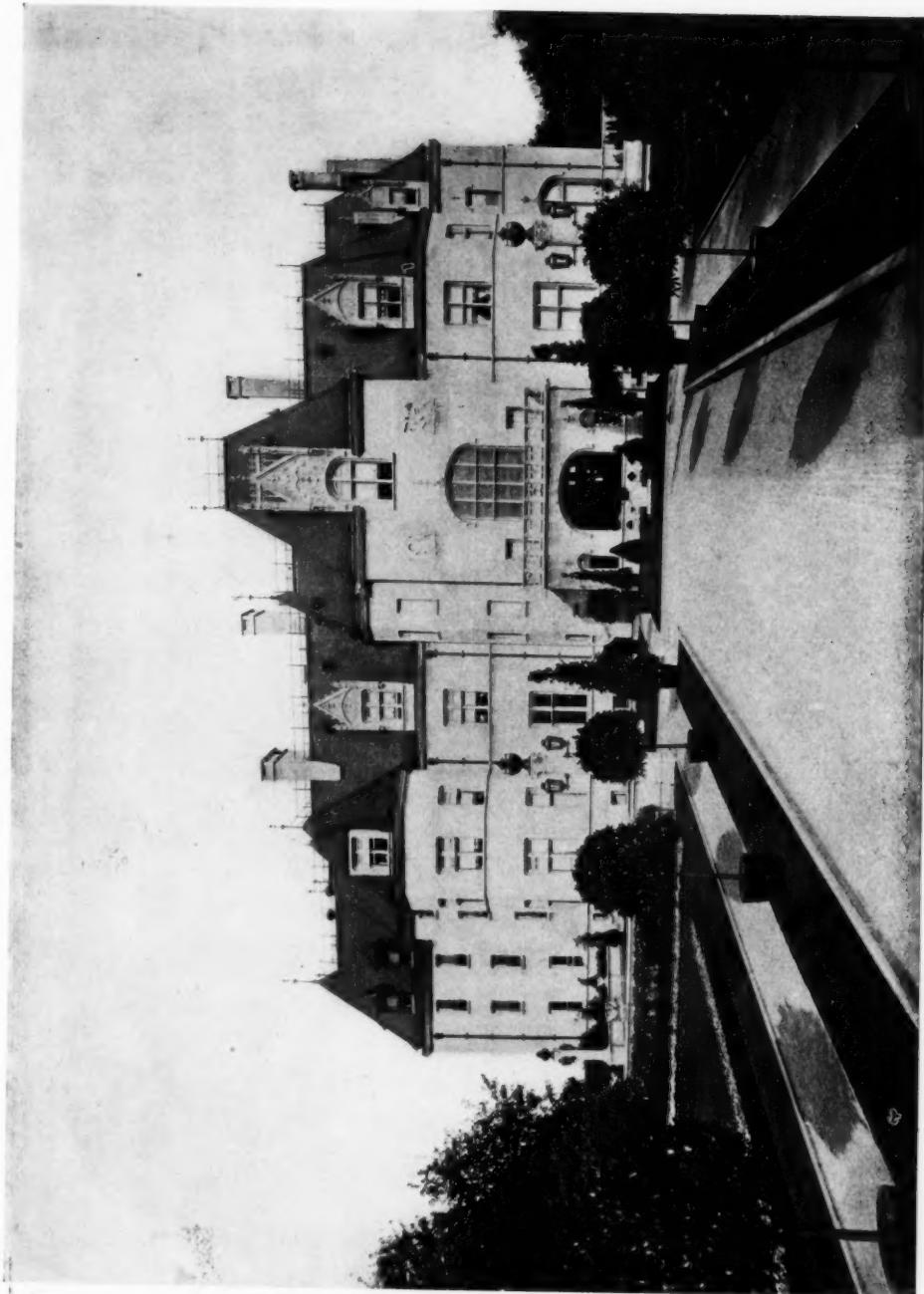
ENTRANCE GATES, RESIDENCE OF OGDEN GOLETT, ESQ.

Newport, R. I.



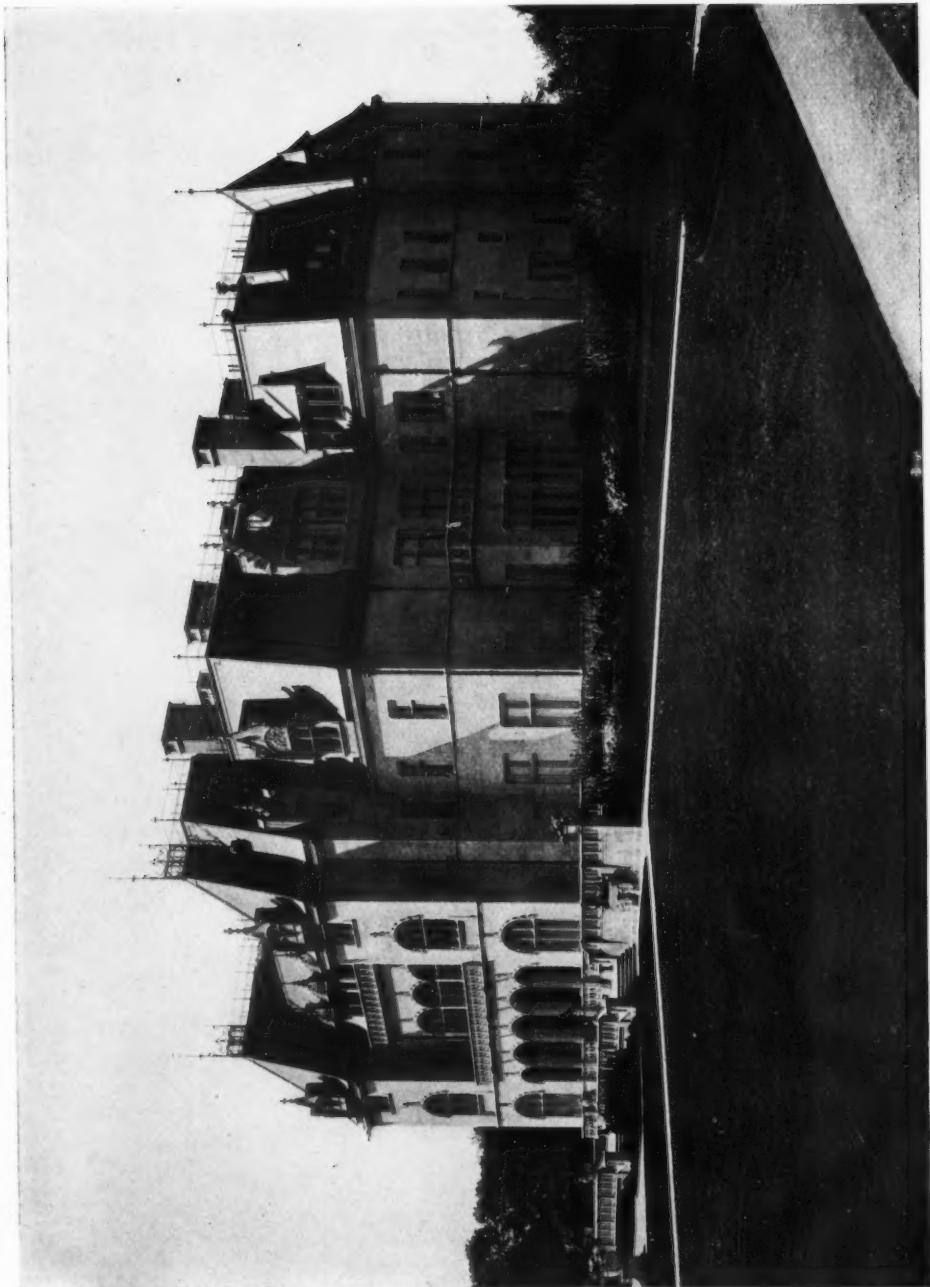
Newport, R. I.

THE RESIDENCE OF OGDEN GOLET, ESQ.



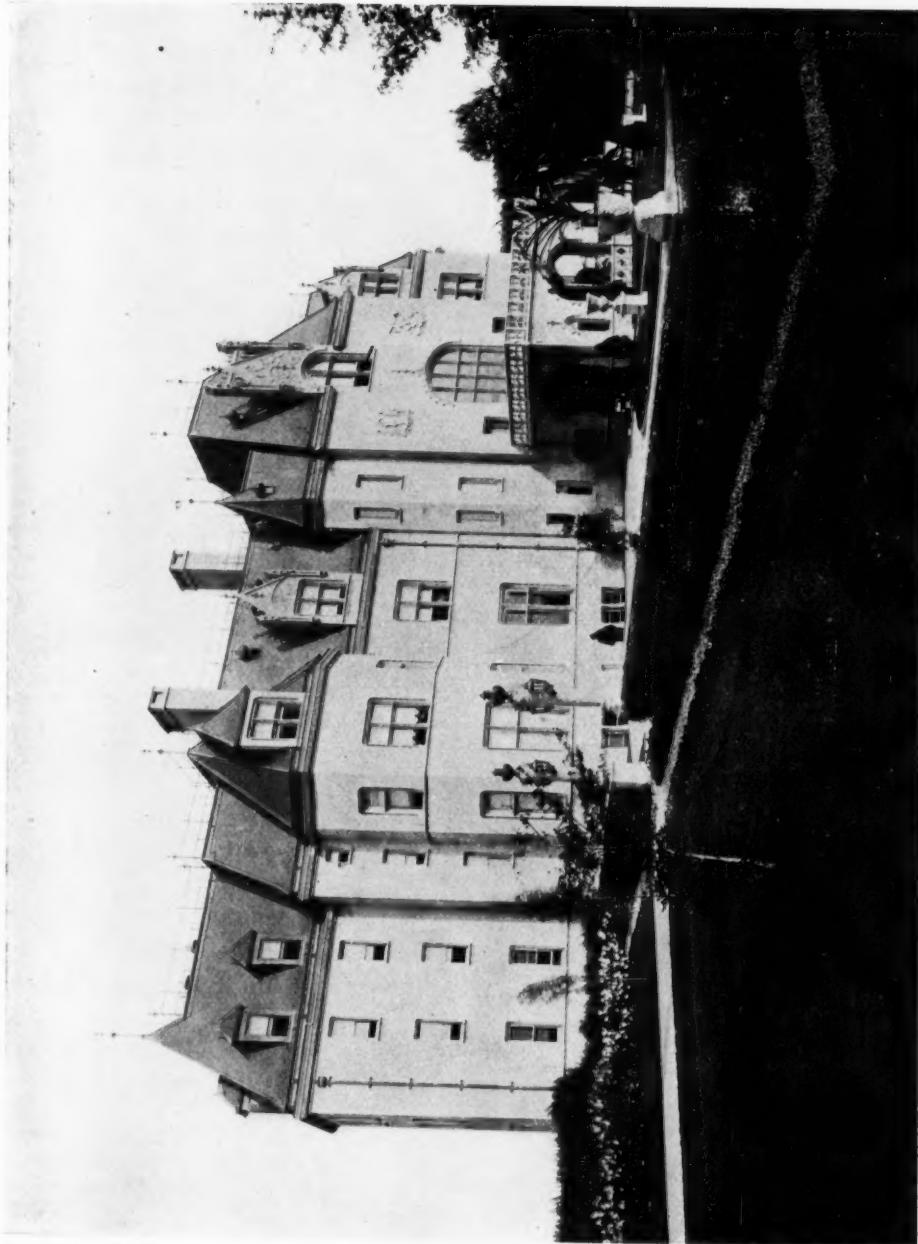
THE RESIDENCE OF OGDEN GOELT, ESQ.

Newport, R. I.



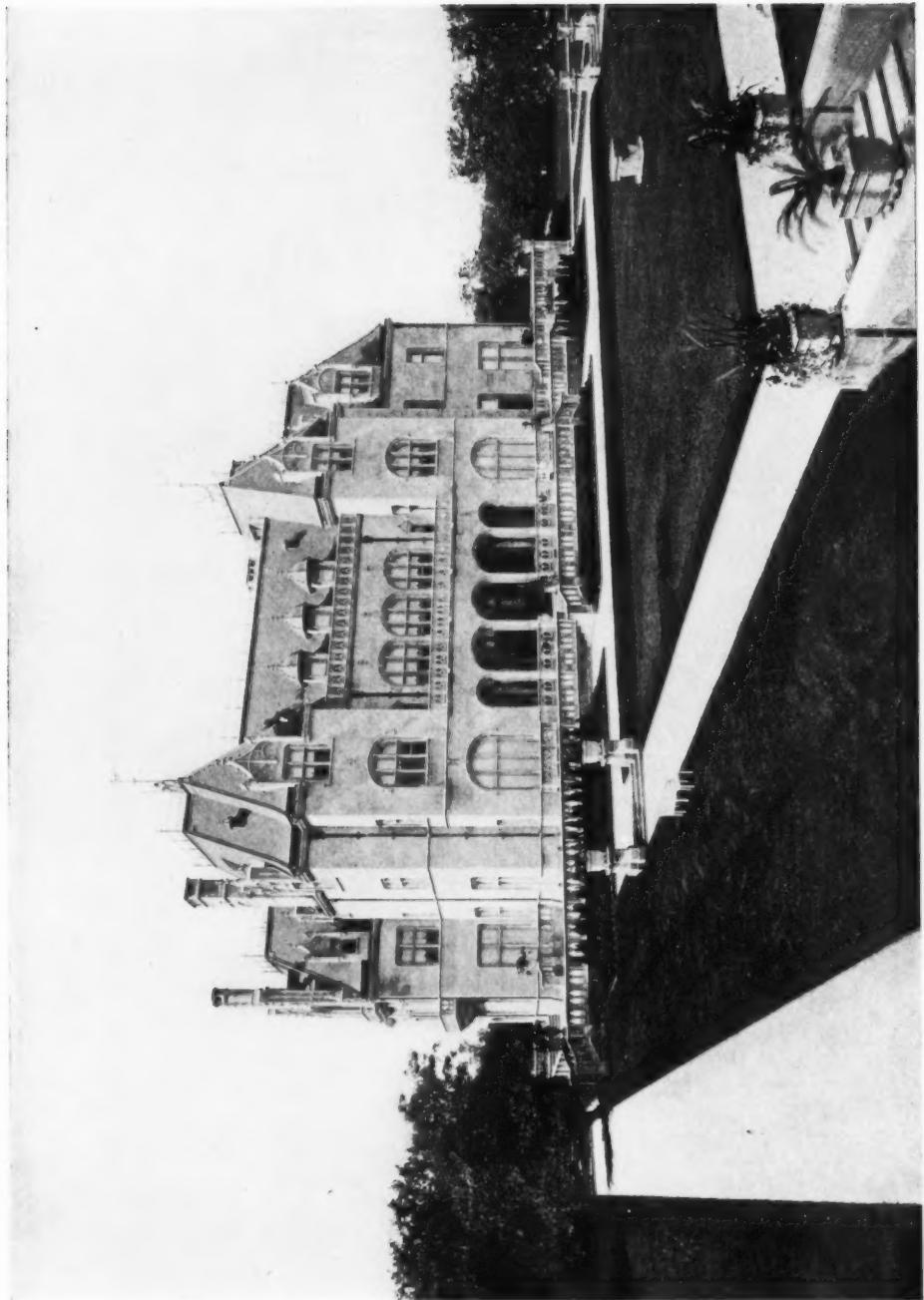
Newport, R. I.

THE RESIDENCE OF OGDEN GOOLET, ESQ.



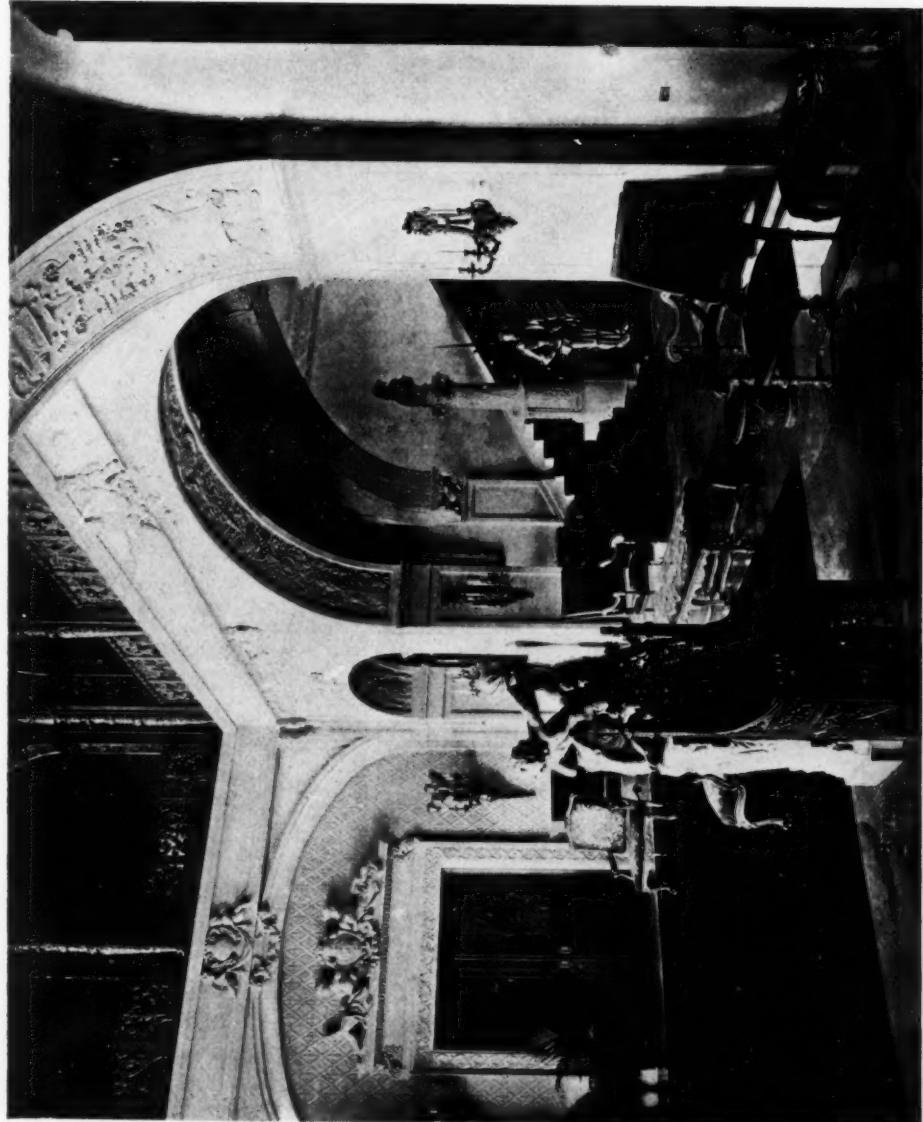
THE RESIDENCE OF OGDEN GOLET, ESQ.

Newport, R. I.



Newport, R. I.

MAIN HALL AND STAIRCASE, GOELT RESIDENCE.



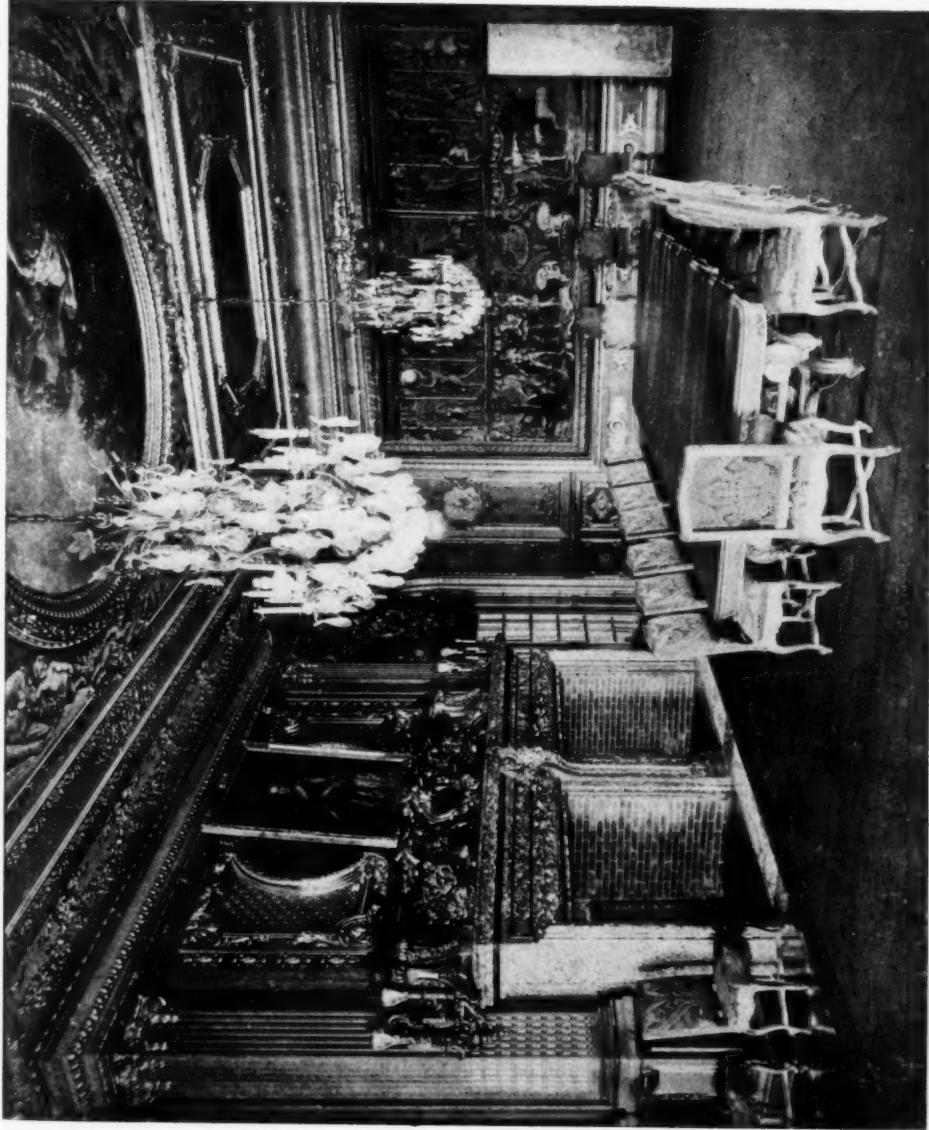


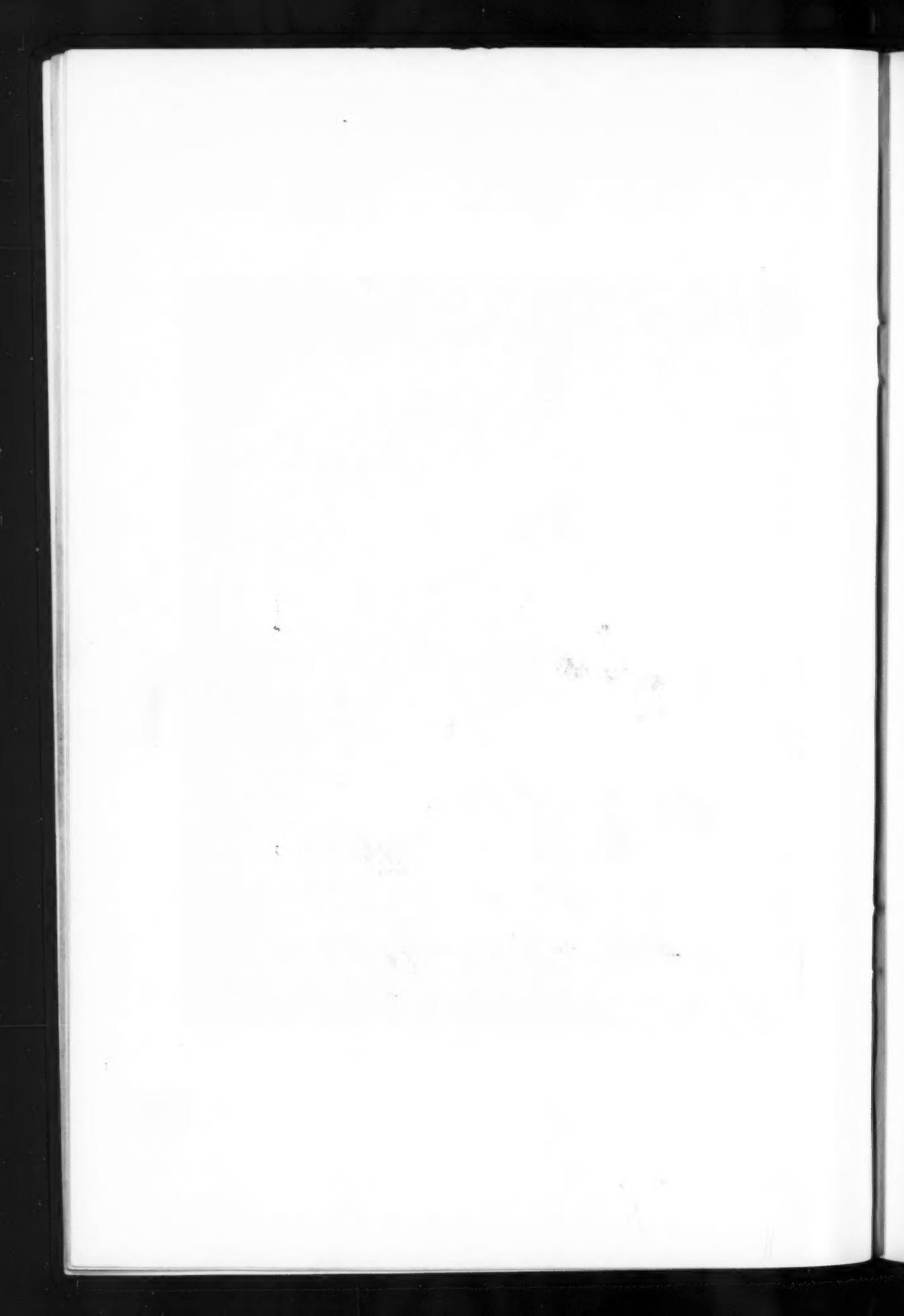
Newport, R. I.

MAIN HALL, GOELET RESIDENCE.

Newport, R. I.

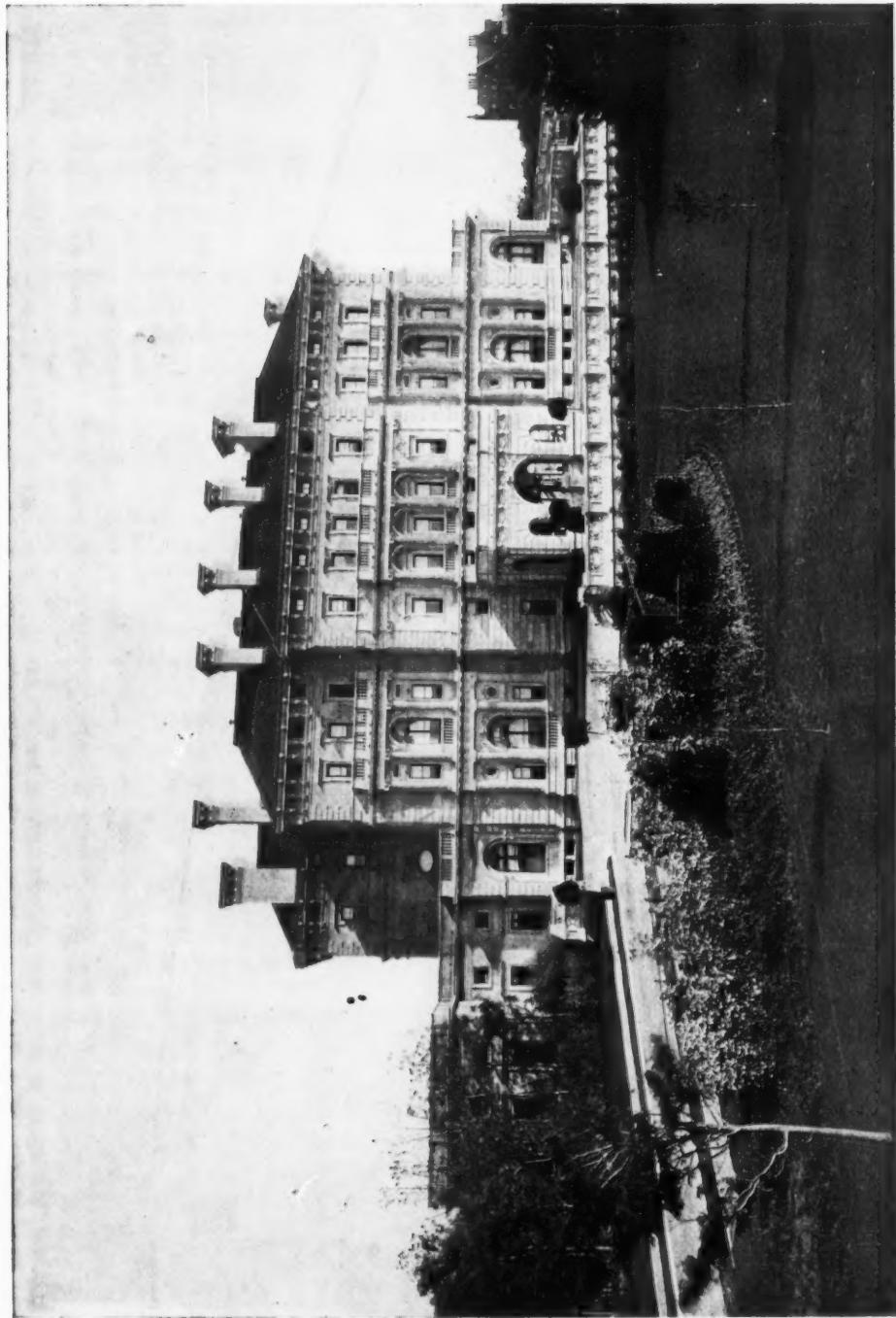
DINING-ROOM—GOELET RESIDENCE.





The "Breakers."

Residence of
CORNELIUS VANDERBILT, Esq.
Newport, R. I.

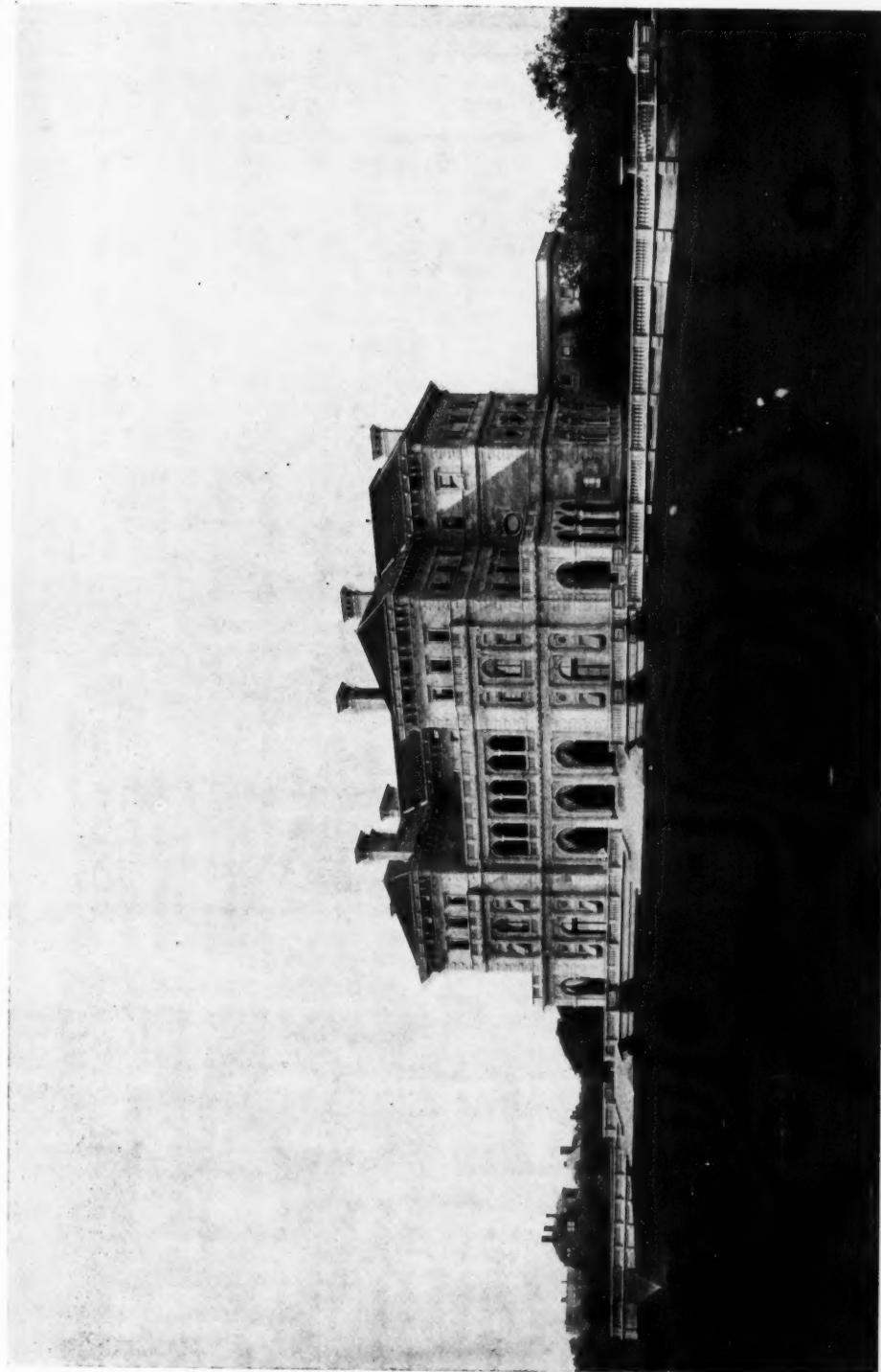


Newport, R. I.

THE "BREAKERS,"

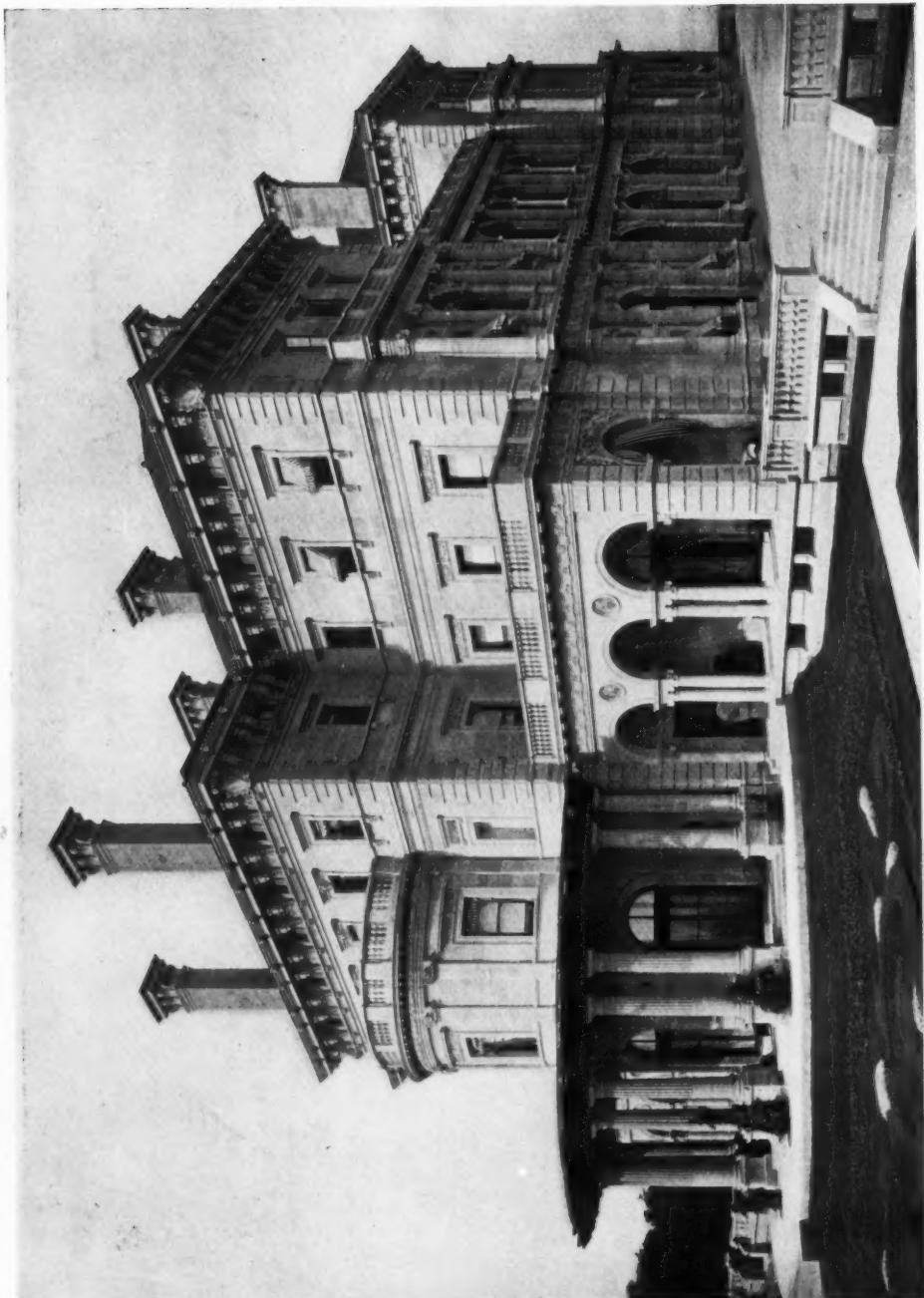
Newport, R. I.

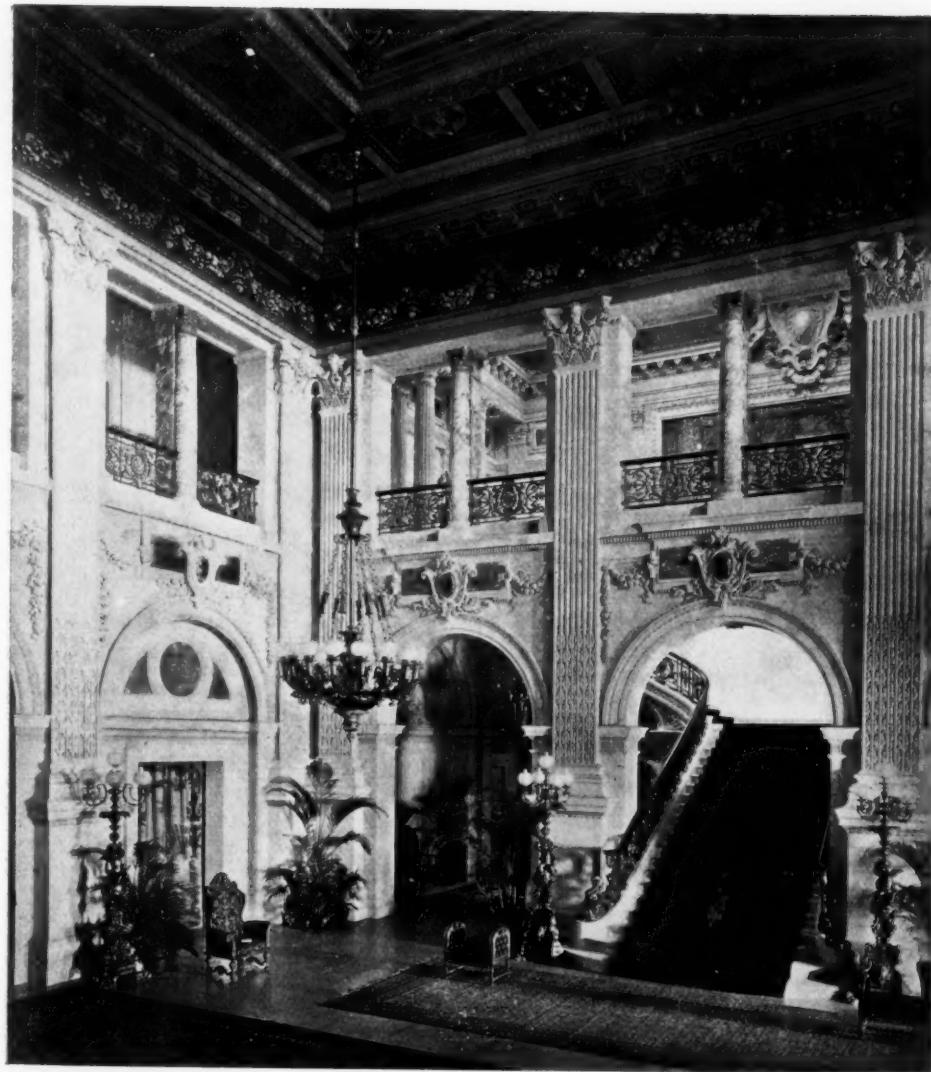
THE "BREAKERS."



THE "BREAKERS,"

Newport, R. I.





Newport, R. I.

THE "BREAKERS" — MAIN HALL



Newport, R. I.

THE "BREAKERS"—MAIN STAIRCASE.

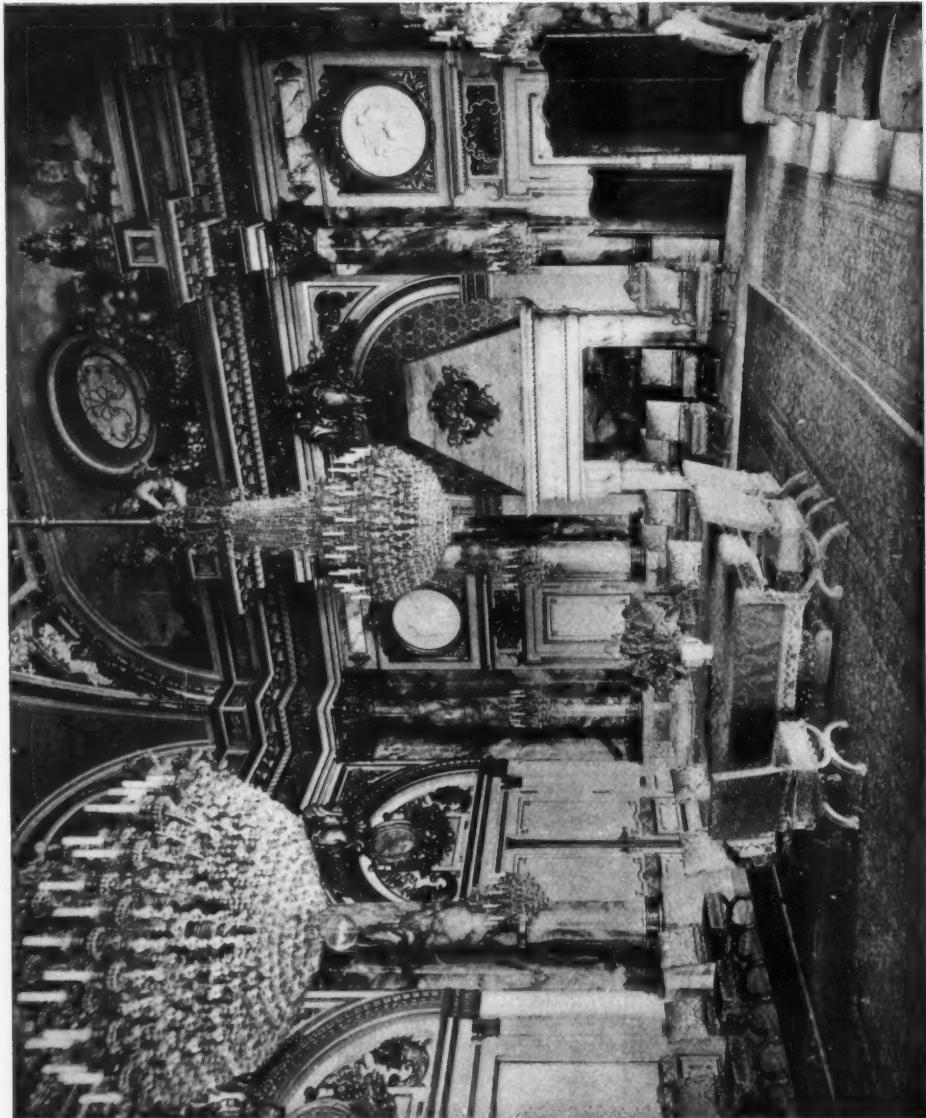
Newport, R. I.

THE "BREAKERS" — SECOND STORY HALL.



THE "BREAKERS" — DINING ROOM.

Newport, R. I.





Newport, R. I.

THE "BREAKERS" — DINING-ROOM.

THE "BREAKERS" — THE LIBRARY.

Newport, R. I.





Newport, R. I.

THE "BREAKERS"—BILLIARD ROOM.

THE "BREAKERS" — FIRST STORY LOGGIA.

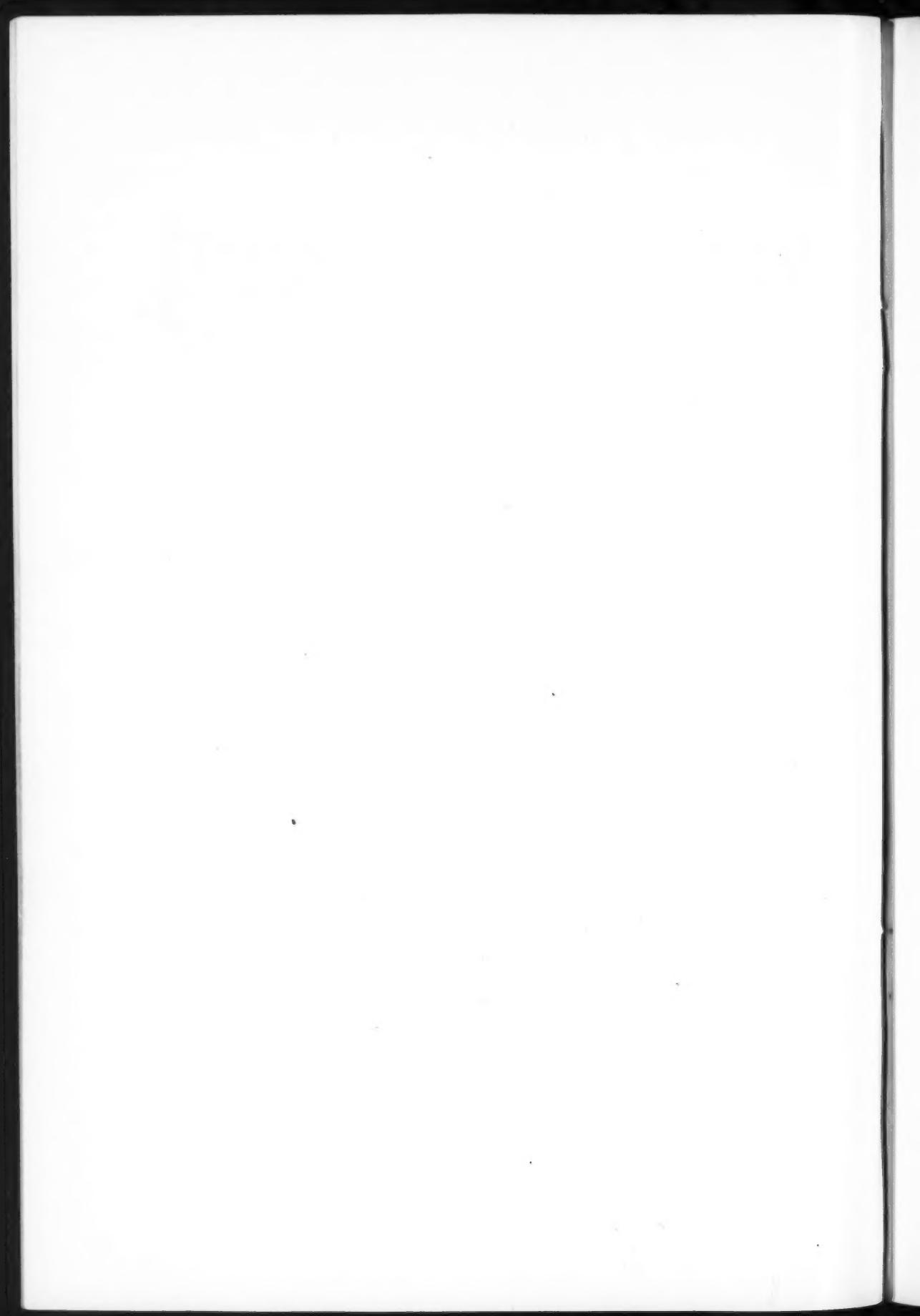
Newport, R. I.





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THE "BREAKERS"—SECOND STORY LOGGIA.



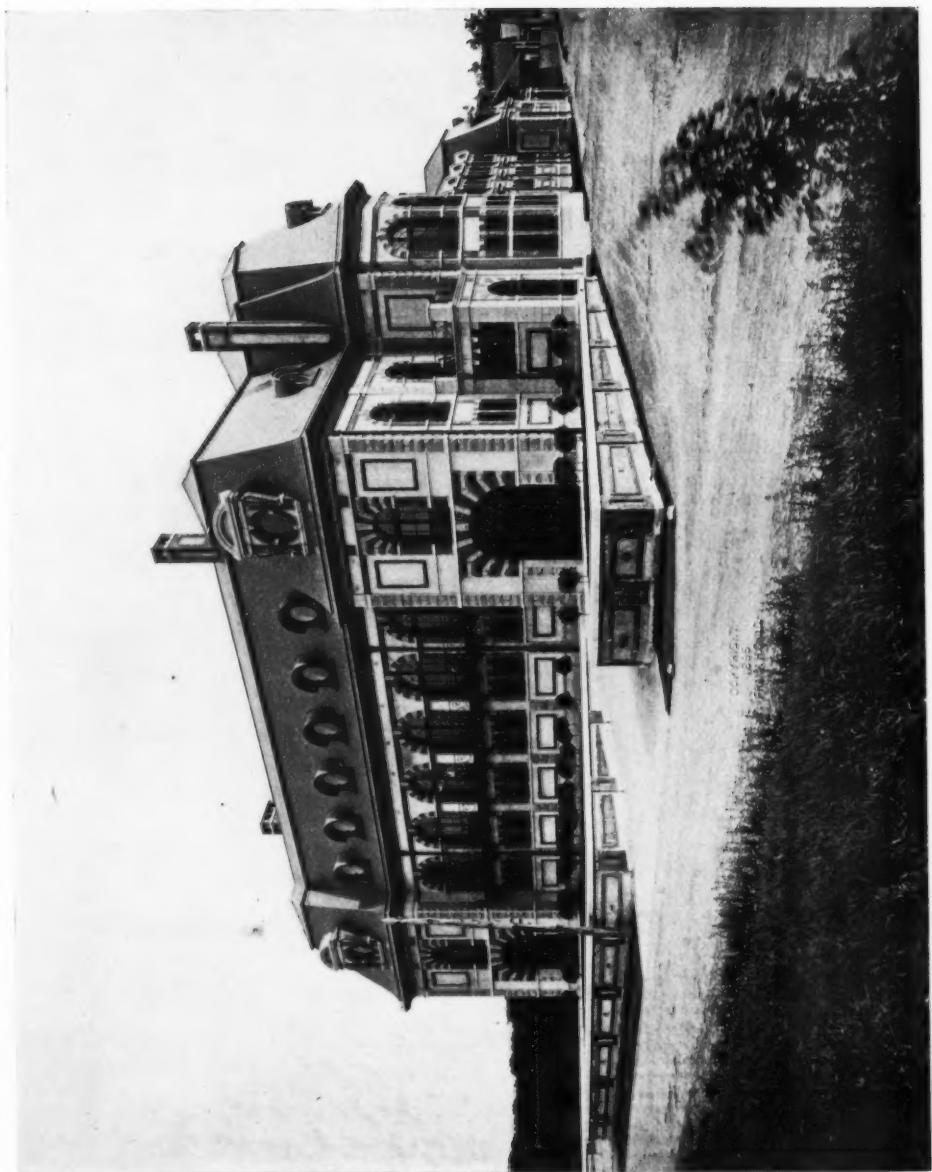
“Belcourt.”

Residence of
OLIVER H. P. BELMONT, Esq.,
Newport, R. I.

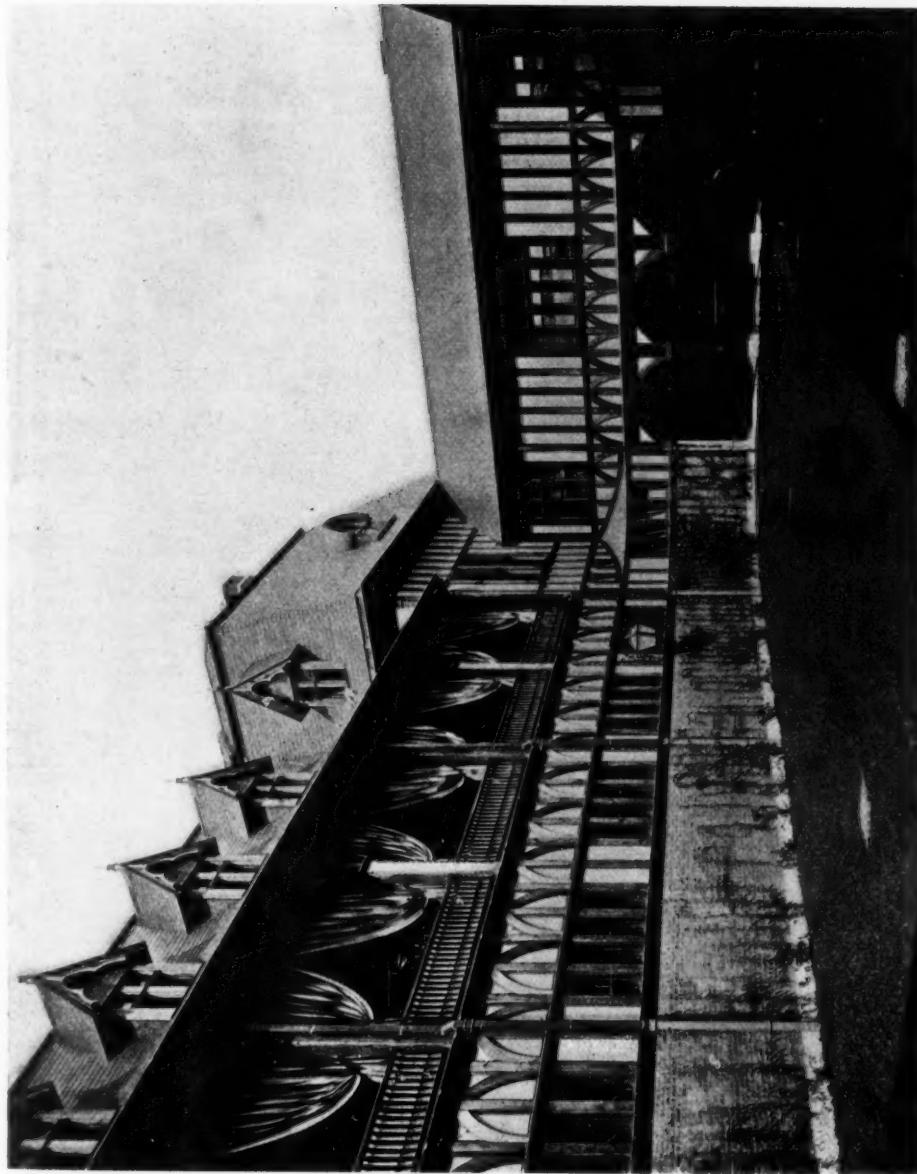
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"WILCOURT."

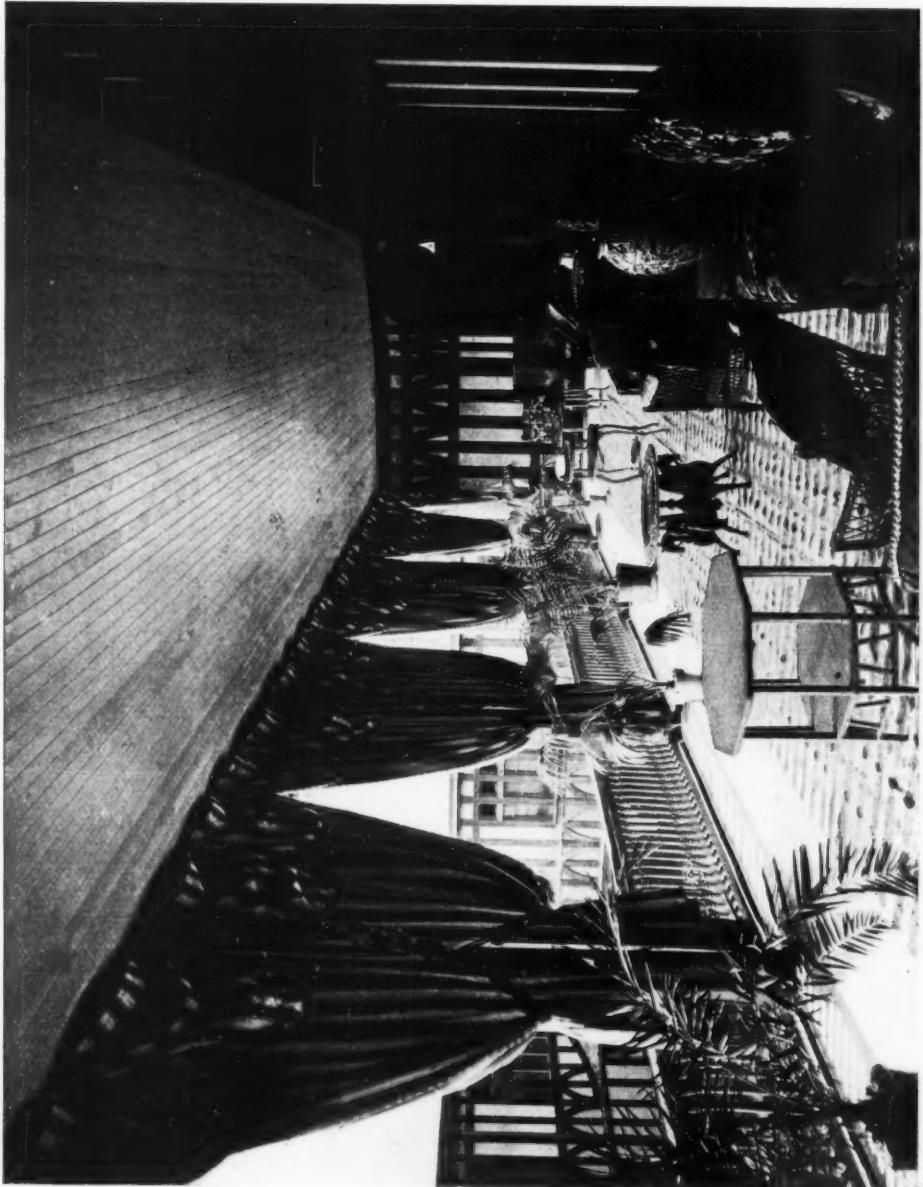
Newport, R. I.

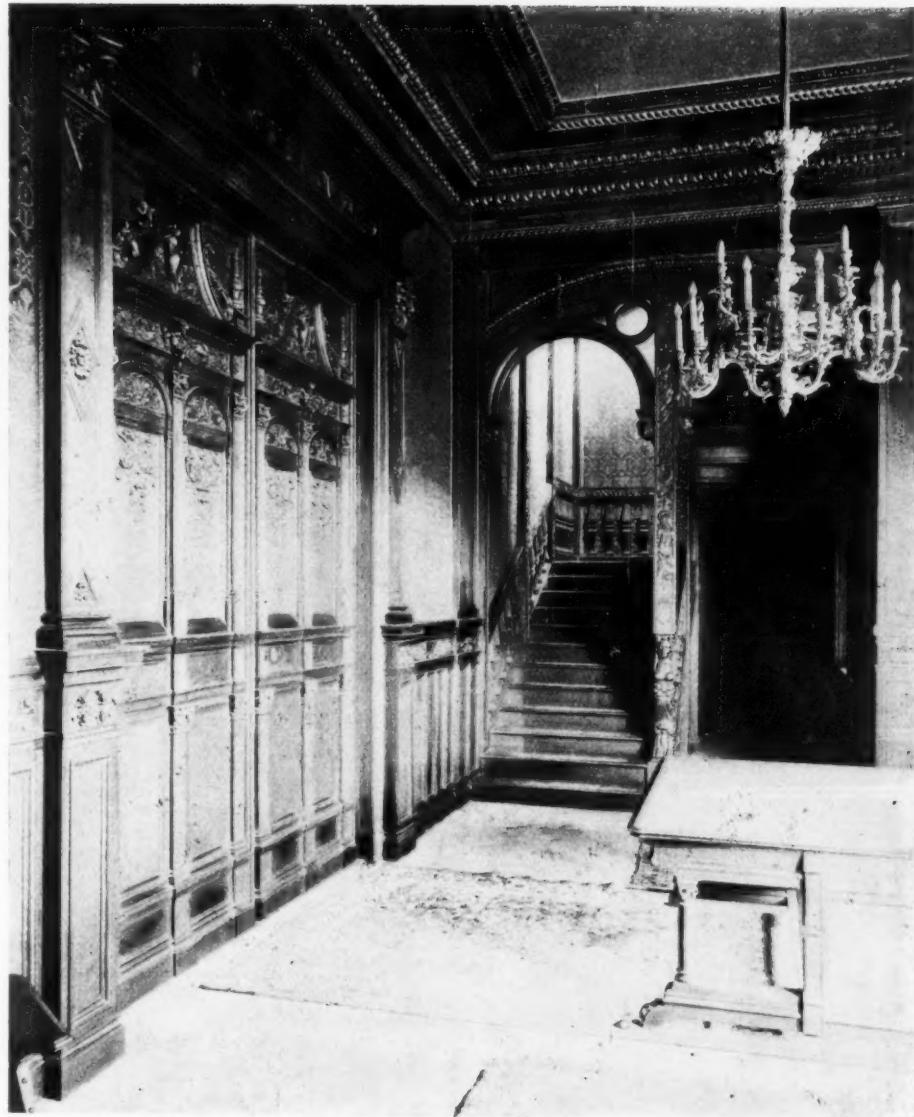


EXTERIOR OF LOGGIA, "BELCOURT."

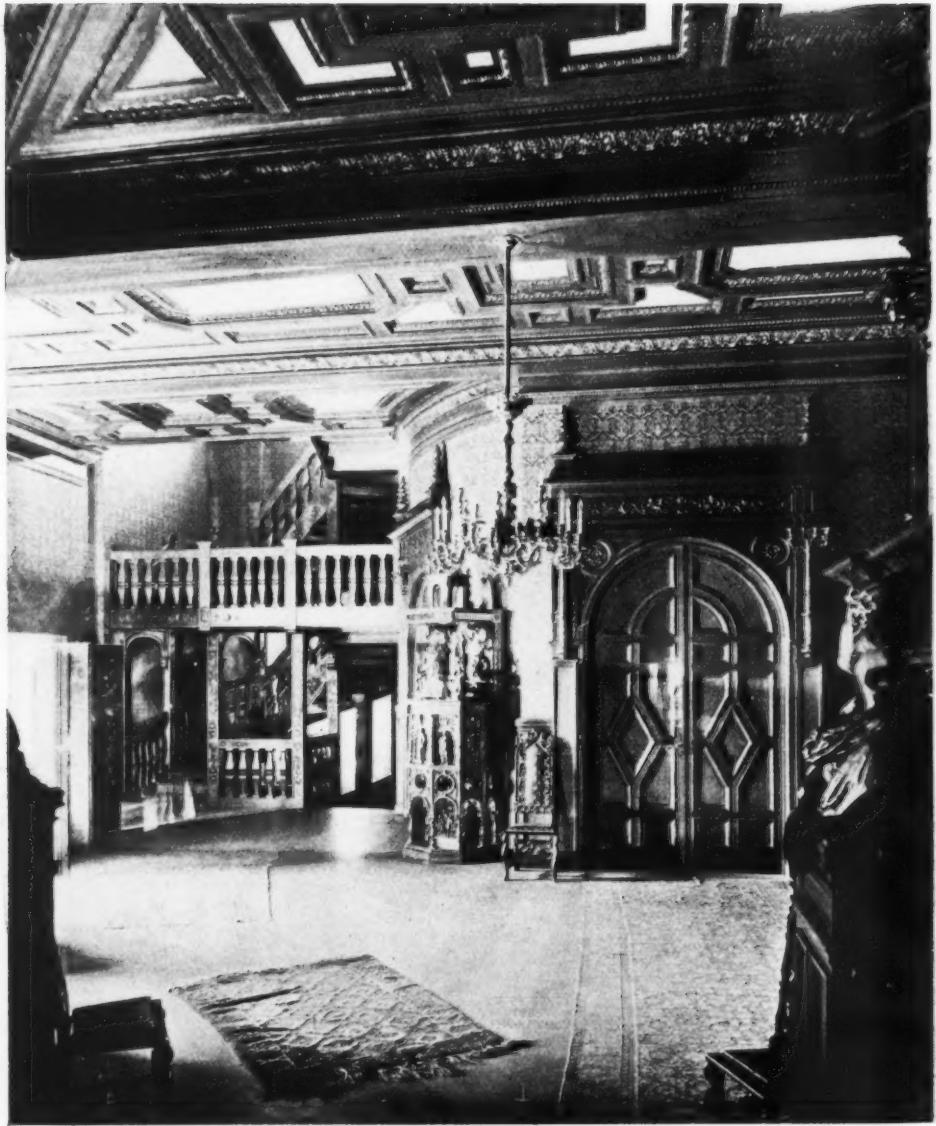


INTERIOR OF LOGGIA, "BELCOURT,"





STAIRCASE HALL, "BELCOURT."

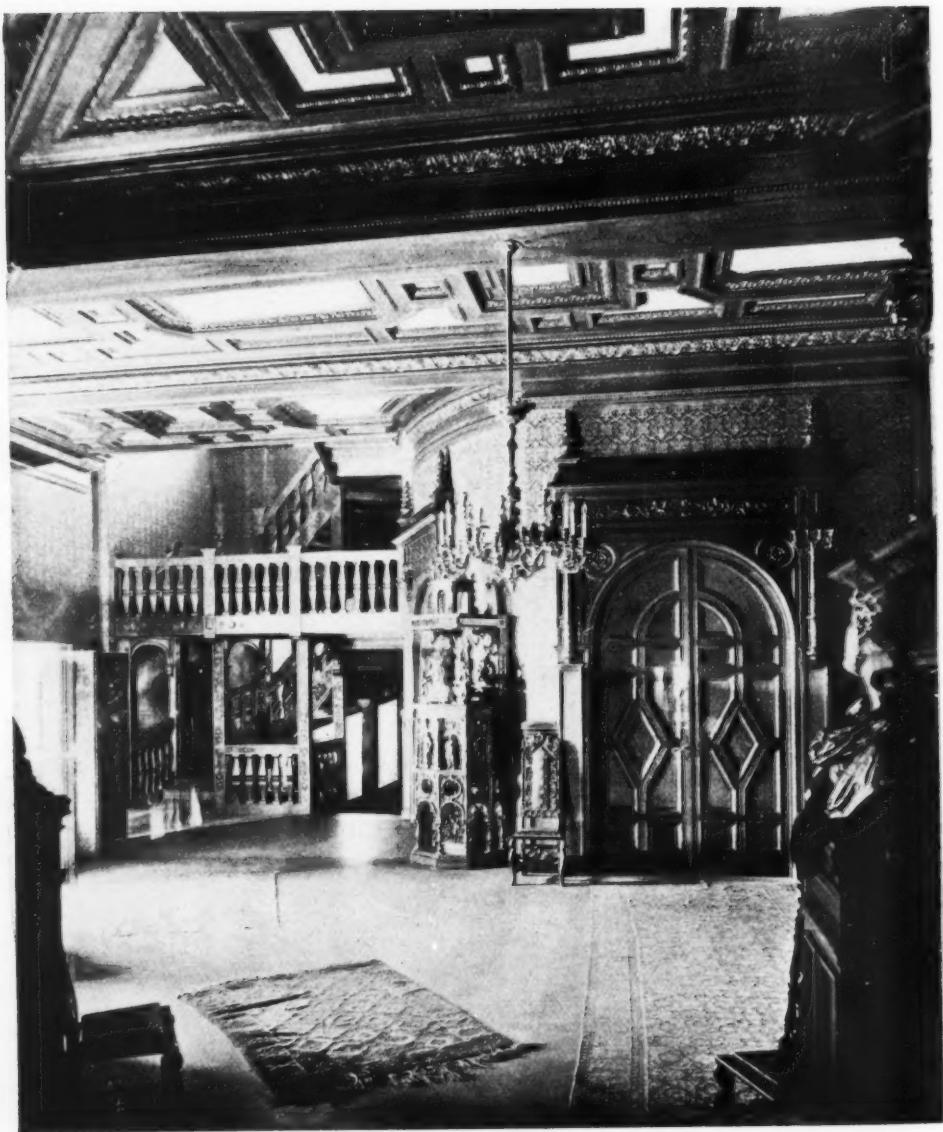


SECOND-STORY HALL, "BELCOURT."

of the basement being carried through on a level, while the rise is recognized in the successive lifting of the roofs. These houses are especially exemplary and suggestive, for they are solutions of problems much more frequent than the "palatial residence" that occupies two or more city lots. The suggestions they carry have been utilized by sensitive designers who have perceived the availability of the style of the châteaux for modern dwellings. It has been utilized in some degree in dwellings that rank among the best on the west side of New York. It has been utilized in a very marked degree by the young architects who are acting as artistic missionaries in *partibus infidelium*, and who astonish the wayfarer by providing him with an occasional artistic and charming house in the style of the French Transitional, in darkest Philadelphia.

I have repeated, without attaching much importance to it, the only disparaging remark that one hears of the architecture of Mr. W. K. Vanderbilt's house, to wit, that it is a château without the accessories and surroundings of a château. Undoubtedly the architecture of Francis I. reached its perfection in the châteaux, and it is worthy of note that the chronological classification is here misleading. Not only the architecture of the time of Francis I., but the works of that great builder himself show wide divergencies. The châteaux, especially the châteaux of the Loire, are essentially as mediæval as the Hotel Cluny, a work largely of the fifteenth century. In the hôtels the builders omitted all that they could, which was all that they were conscious of, of their inherited way of thinking, and showed the same eagerness to adopt the new forms and the same desire to appear "in the swim" and "up to date" that characterize the common modern architect. Thus contemporary buildings of the sixteenth century appear by turns essentially Gothic and Renaissance—that is to say, French or Italian. Undoubtedly, however, the architecture of the châteaux appears to its best advantage in châteaux, that is to say in country houses set in spacious and park-like grounds.

Ochre Court, the house of Mr. Ogden Goelet, at Newport, nominally a "cottage," by its situation and surroundings a villa, by its sumptuousness and elaboration a palace, is by its architecture a true château. Here it will not be disputed the architect has risen to the new opportunity that was furnished to him by the extent and detachment of the building and by the power of conforming and subordinating the immediate surroundings to the architecture. Such an accessory as the fountain with its screen of arches is not only in itself an admirable piece of design, but serves an important purpose in signalizing and specializing the character of the "place." The design of the house itself is most distinctly and triumphantly successful. In fact, in its subtle harmony and its sure felicity the entrance-front of Ochre Court is to me precisely the most artistic composition that its author has produced. I am bound to admit that the wing of subordinate apartments on the left of the entrance-front is not thoroughly incorporated in the general design. Spacious as it is, for Newport, the site is not spacious enough to admit of the reduction of these subordinate apartments to their real place of offices by giving them less height and spreading them over a wider area. They now form an annex which in considering the design is negligible, and of which the treatment denotes that it is meant to be as much as possible neglected. Omit it, then, and consider the front proper, which really concludes with the angle just to the left of the three-sided bay. How admirably complete and sufficing is the balance of the composition without formal symmetry, how subtle the devices, including the stopping of the string-course which divides the flanking stories, by which a due and not more than a due predominance is given to the entrance pavilion, and how admirably is this in itself composed and detailed. Could anything be more effective than the expanse of wall, with only the great opening at the centre that so clearly designates what is behind it as the great hall of the mansion, the single



SECOND-STORY HALL, "BELCOURT."

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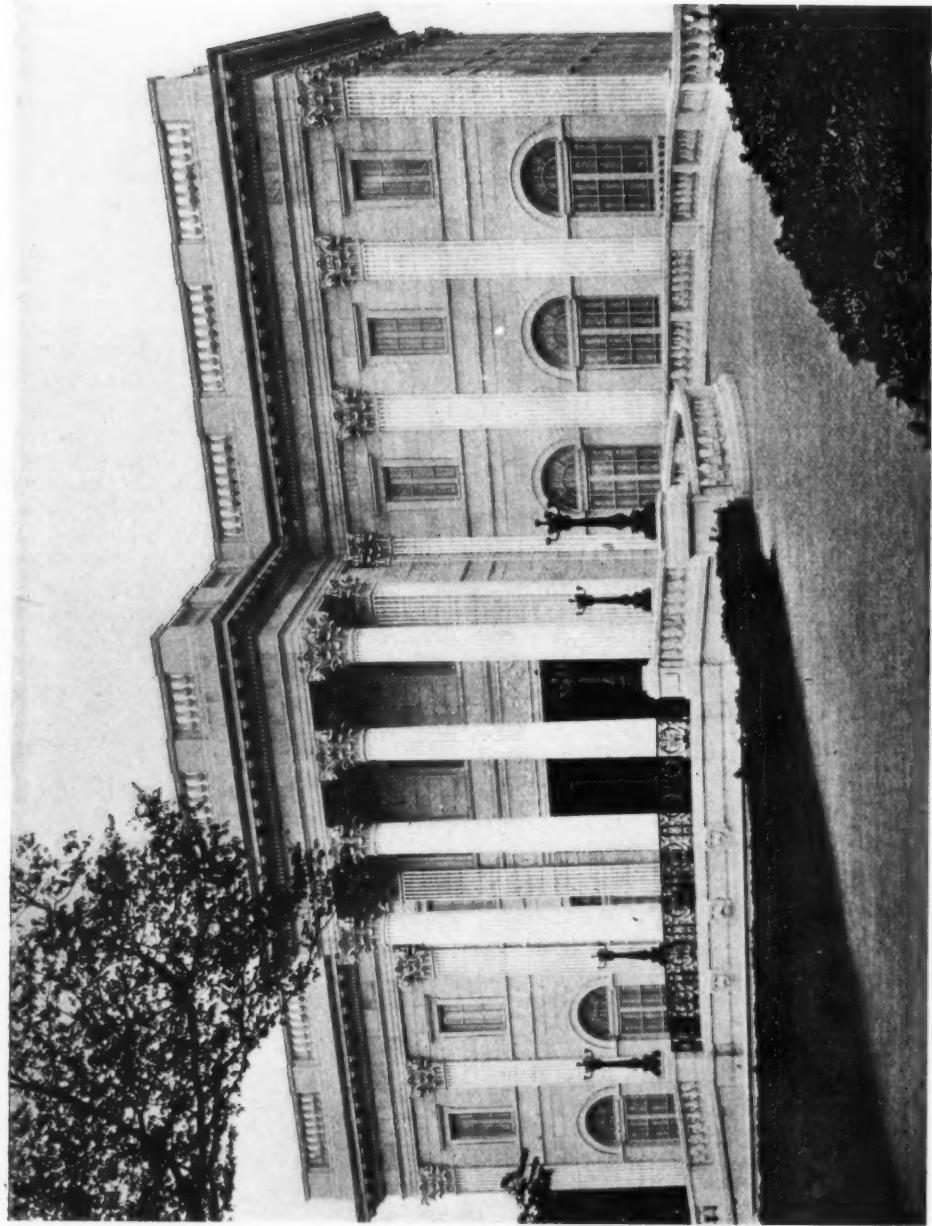
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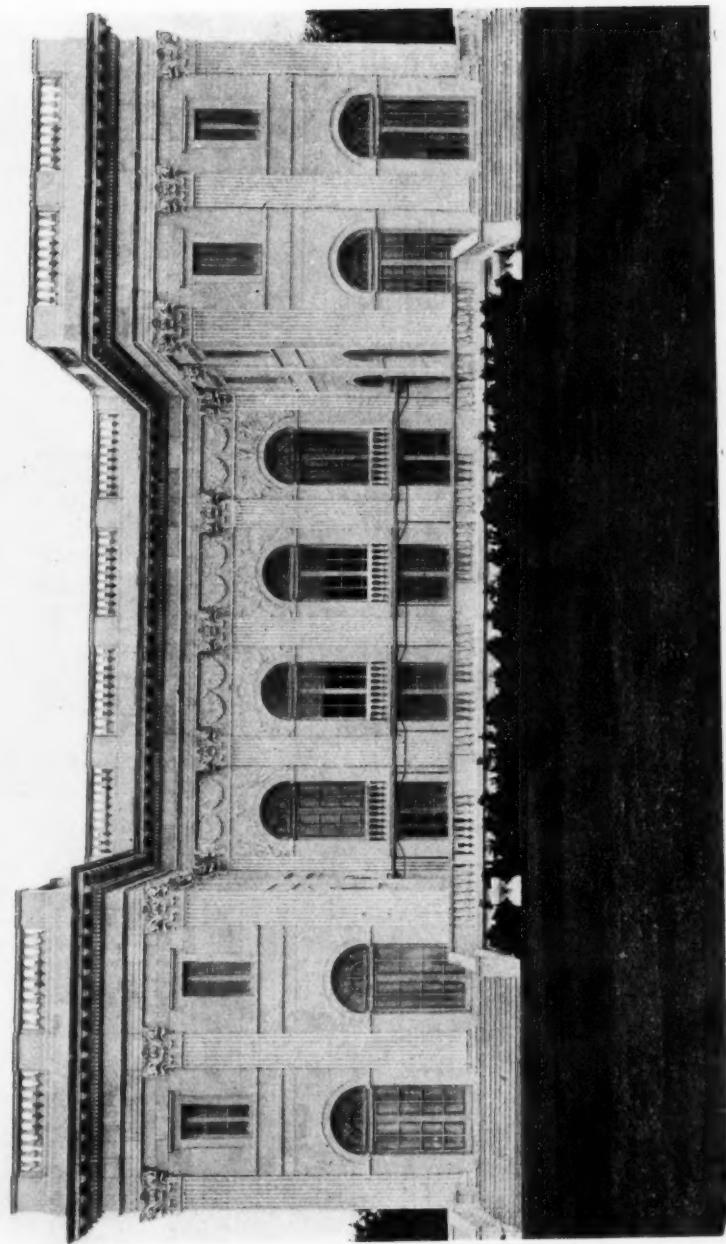
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Newport, R. I.

THE MARBLE HOUSE.

Residence of Mrs. W. K. Vanderbilt.





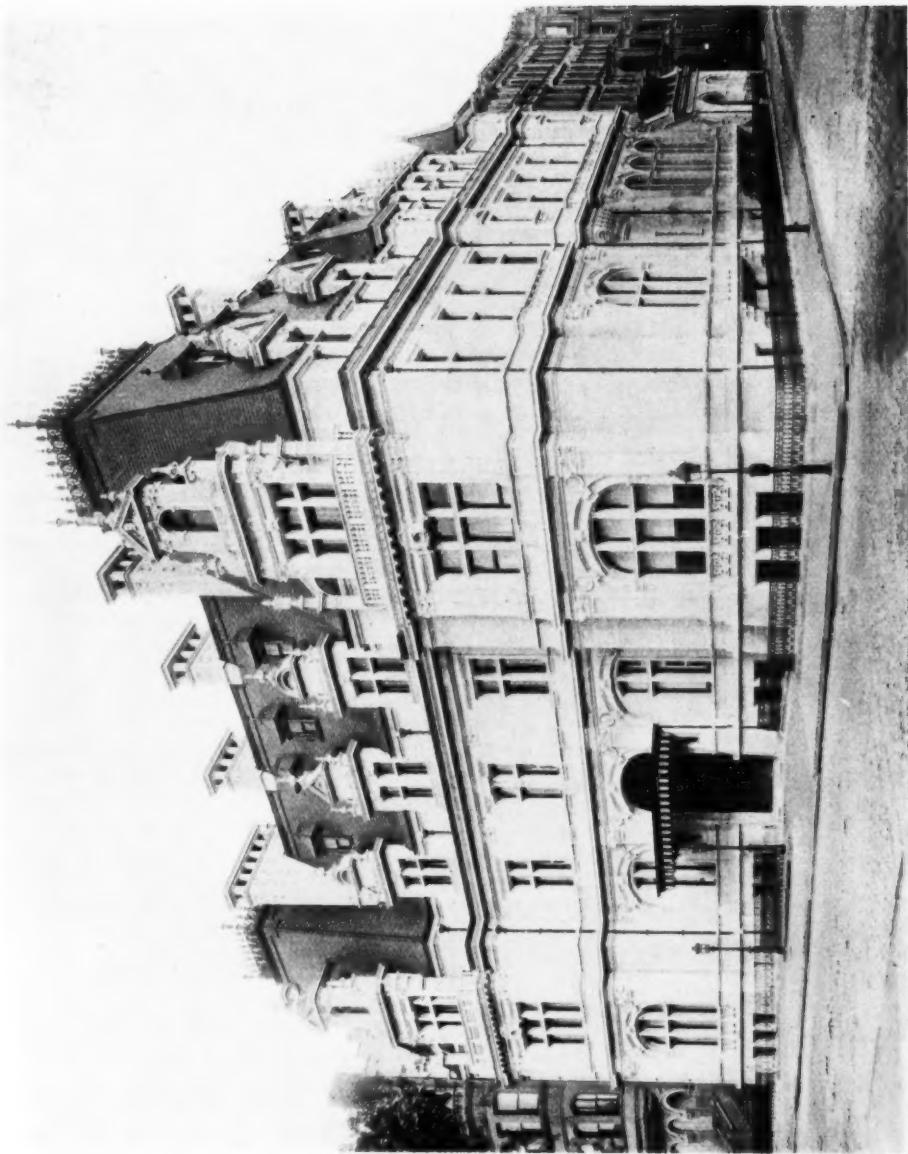
Newport, R. I.

THE MARBLE HOUSE.

tall, rich dormer relieved against the otherwise unbroken slope of roof, and the devices, the low plain openings that give upon the balcony and the embossed masses of carving above, by which the expanse is at once relieved and accentuated? What have our modern times to show more noteworthy than this as an example of a free and romantic domestic architecture, or how is it less noteworthy than the châteaux of the Loire, except that it has been preceded by them? And the modern designer has proceeded not by way of imitation but by way of assimilation, by learning and in his turn and in his own way inculcating the lesson they had to teach. The garden front of this house is a scholarly, rich and tasteful performance, an excellent "example" of the architecture of the châteaux. Very likely many observers may prefer its more exact symmetry to the subtler harmony and balance of the other, forgetting Bacon's "there is no excellent beauty that hath not some strangeness in the proportions." But to the present observer the personal and incomminable element in the design of the entrance-front is much more than mere architectural scholarship, is the individual quality that the best use of architectural scholarship is to elicit.

Even this, however, does not fulfil the idea of a château, and that idea cannot be realized under the conditions that obtain at Newport. The grounds of the great places there are ample for villa-sites, but inadequate as the setting of the palaces that have come to be built upon them. In this case, as we have seen, the restriction reacts upon the architecture and mars its complete expressiveness by forcing the dependencies of a great house into rivalry with its principal apartments instead of enabling the designer to keep them in subjection. But even waiving this, no sensitive observer can look upon the palaces of Newport without feeling that they are misplaced. A noble mansion that might well be and that in another country would be the show-place of a shire is cramped into a site proper to a watering-place villa. A château cannot be fairly estimated in

such a place. One thinks of Blois dominating its town, of Chenonceaux bestriding its river, of Chambord, with its park of twenty miles in girth, and has to own that other things than the skill of the architect go to the making of a true château. Time, of course, and that can be supplied only in time, but also space, and that the social exigencies of Newport will not permit. It has been Mr. Hunt's great good fortune to have for once, in Biltmore House, an opportunity to design a true château, with the surroundings and accessories of nature and of art proper to a château, having not only the elaboration and the costliness, but also the magnitude, and above all the detachment, which the scheme requires. This was a chance to create a true "seat" to enhance the refinements of his architecture by its contrast with the noble and primeval landscape which it commands, and to invoke the most skilful co-operation in the landscape-architecture which mediates between the two. The illustrations will show much better than the writer, who shares with the reader the disadvantage of not having seen the actual work, can tell, to what result the architect has employed his opportunity. The reader cannot fail to note how great an advantage has come from the absence of limitations, not alone in cost, for Biltmore House shows no more regardlessness of expense than the palaces of Newport, but in any respect whatever upon the freedom of the designer. No pent-up "villa site" here contracted his powers. As much as he might need of "the whole boundless continent" was at his disposal. Nobody can fail to note the advantage of this freedom in the royal scale of the château which he has set upon the plateau converted into a terrace, nor how the architect has used his advantage. The dependencies of the main building here take their places as dependencies, for there is ample room to let them come as they will and not as they must, and this amplitude is of the utmost value, as enabling the architect to give the sense of freedom, of variety in unity, and of frank expressiveness that forms the charm of the masterpieces of the style he has



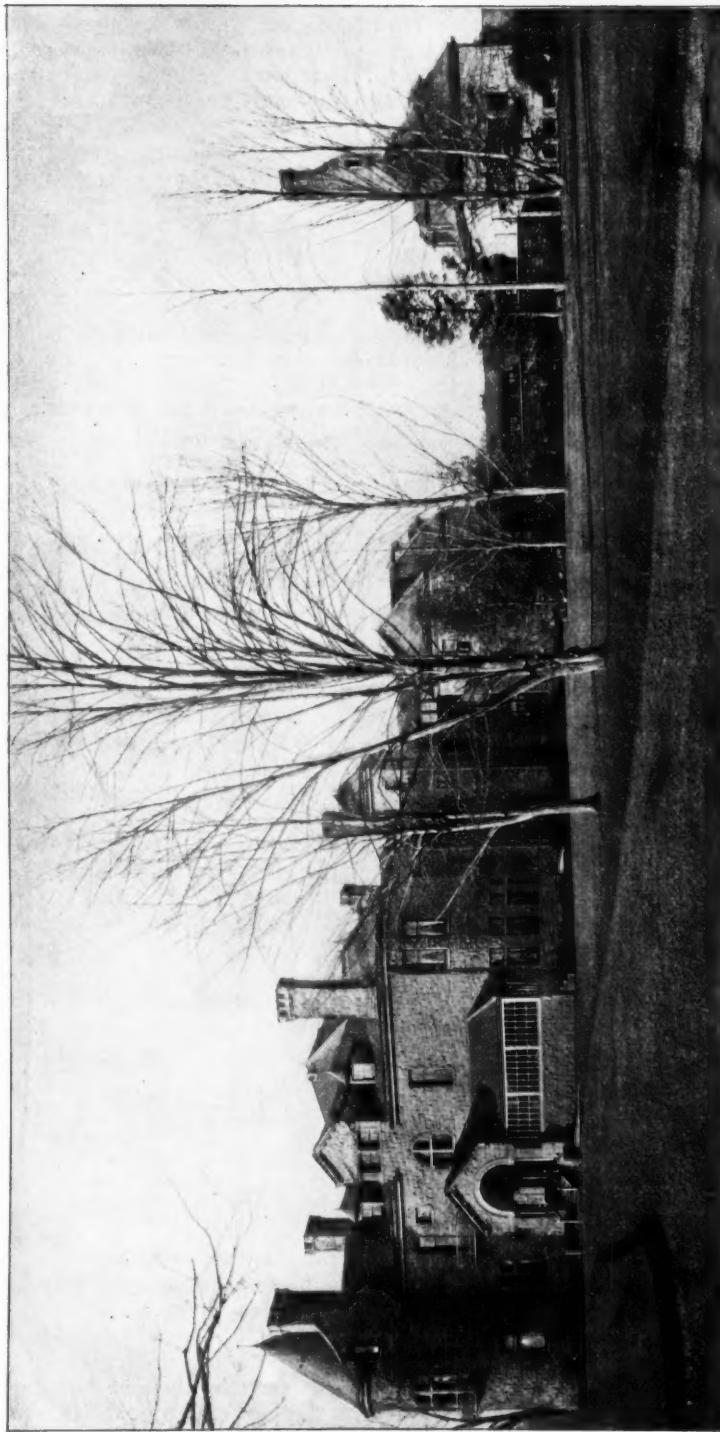
5th avenue and 65th street, N. Y. City.

RESIDENCE OF JOHN JACOB ASTOR.

chosen. Neither can it be overlooked how effective is the contrast between the richness and refinement of the entrance-front, a richness and refinement enhanced by the formal garden which forms the approach, and the comparatively rude vigor and spirit of the opposite front which opens directly upon the wide prospect of the wilderness. Upon this side the sloping revetement that faces the terrace and extends far beyond the house, not only furnishes an effective base for the mansion which stands at its centre, but becomes itself an important member of the architectural composition. Its value is very greatly enhanced by its ingenious masonry, which not only contrasts effectively with the smooth ashlar above, but gives to the basement a texture which is visible and valuable as far as the building can be seen. The front as a whole, and including the stables at one end as well as the terrace wall at the other, is an excellent example of a general balance in composition, and of its advantage, certainly in a country-seat with wild natural surroundings, over a more strict and formal symmetry. The centre, distinctly marked and bounded by its two towers, is emphasized by the expanse of wall of the wing on one side and the low cluster of the stables beyond, and on the other by the emphatic blots of shadow of the loggia and by the terminating terrace-wall. In the other front, as its general scheme made fit, there is a somewhat closer approach to formal symmetry. The masses on each side of the central tower with the attached open staircase, of which the motive, and only the motive, is borrowed from Blois, are equivalent, but they are not equal, and much less identical, and it is to the inequality in their equivalence that the front owes the life and movement it obtains without sacrifice of clearness or of dignity. The roofs are here as successful as the walls they crown and cover, and unite instead of scattering the masses beneath, while there are in their treatment very positive felicities, as in the steep hood of the three-sided bay at the end of what may be called

the forest front. I wish that it had been possible to illustrate more fully the detail by which the effect of these dispositions is so much heightened. But the general views suffice to prove that if the architect had an opportunity in its kind unequalled on this side of the ocean—and indeed upon the other, since the old châteaux of like extent with Biltmore House were composed piecemeal and in different generations, and not at a single stroke—he has taken advantage of it to produce a result also in its kind unequalled.

It seems to me that the brilliant success of these buildings, which undoubtedly constitute the most fruitful and influential part of Mr. Hunt's long professional labors, would of itself sustain my contention that he is essentially a romantic and not a classic. That contention seems to me to be further supported by the less pronounced success and felicity of his classic designs. It may be, of course, that this seems so to the critic because romantic art appeals to him more forcibly than classic, and that it is his personal equation rather than that of the artist that needs to be allowed for in this comparison. But one cannot designate any works of Mr. Hunt that are classic in spirit, unless a partial exception be made of the Belmont tomb, which are so successful in their own way as these works of romantic architecture. The Administration Building at the World's Fair may occur to the reader's mind as an exception, but I said classic in spirit and that is classic only in letter. Though it is compiled of classic forms they have been transmuted into a modern result. One cannot conceive it as having been designed in republican Athens, setting aside the forms later than Attic, or even in imperial Rome. This alert and bristling pyramid is as much and as characteristically Parisian of the second Empire as M. Garnier's Opera-house itself, which is so clearly the most Parisian thing in Paris. In the town-house lately completed for Mr. Astor in New York, the architect has essayed the Parisian or urban version of what must still be classified



Hyde Park, N. Y.

RESIDENCE OF ARCHIBALD ROGERS, ESQ.

as the architecture of Francis I., a phase in which the importation from Italy had almost overborne the indigenous French spirit, in which both composition and detail had become formalised if not classicised. There is in this phase something lumbering and uncouth than which nothing could be less French and which reveals itself as the awkwardness of a borrower, for the French builders of the sixteenth century, when they undertook to reproduce the new Italian fashion, produced something the same impression as a Japanese lady in European costume. One thing doubtless is to be said in favor of the adoption of the more classicised French architecture, be it of Francis I. or of Henry II., and that is that it is unmistakably urban and obviates the criticism passed upon the works of the true French Renaissance of not being urban enough. There is no dispute that this is an "*hôtel*" and not a *château*. The style offers an advantage also for the emphasis of length, which is the most striking fact in the design, and which is so successfully managed that one would guess the entire front to be much longer even than its actual and unusual extent of 125 feet. The most striking and successful feature of the composition is not, however, upon this front, but is constituted by the three tiers of triple openings at the centre of the side, admirably composed and detailed. Upon the whole, this mansion is respectable and dignified; it is even imposing, but it lacks the romantic charm that belongs to the work of its designer when he is working in a freer manner, while it does not at all aspire to the classic purity that to many observers is an attainment even more attractive than romantic charm.

A building that does evidently so aspire is the Marble House built for Mr. W. K. Vanderbilt at Newport, but it can scarcely be said to attain. The portico in itself, with its monolithic columns and its colossal Roman Corinthian capitals, is very stately and imposing, but it derives little additional impressiveness from its setting. The portico may architecturally comprise the whole front, the wings being

entirely subordinate appendages, or it may be merely a central decoration in an expanse of wall. Very successful façades have been composed on each of these lines. But it seems that here it is either of too little importance or too much, being virtually equivalent to either of the wings, and the front thus consists of three equal parts. Moreover, the front suffers from the concealment of its base, by which I do not refer to the devices to which the owner has resorted to obstruct its visibility, but to the cutting off of the stylobate by means of the balustraded driveway which is part of the architectural scheme. So that, upon the whole, the main front does not give that sense of exactness and felicity in proportion, that impression of just-rightness which we call "classical," classic and correct though the front be. The garden front of the same dwelling seems to me a far more successful composition. Here the recessed centre is much longer than either of the projecting wings, nearly as long as both of them, and this difference at once establishes a proportional relation between the parts and renders it possible to unite them into a whole, such as it is impossible to compose of three virtually equal parts. Moreover, the disposition suggests and promotes an emphasis and predominance of the horizontal lines, whereas one of the misfortunes of the composition of the other front is that it prevents the predominance of either height or breadth and the subordination of the other dimension. Again, the garden front has the advantage of a distinct and emphatic stylobate, and the treatment of this terrace, with its flanking stairways and its central balustrade is an integral and effective part of the architecture. Indeed, it is a stately and harmonious front, to the complete success of which the only drawback is the tristylar engaged order of the wings, an arrangement upon which I have remarked in the pavilions of the Administration Building. This disposition, I think, is not preceded in antique architecture, though abundantly in the Renaissance, and in these instances appears to be clearly a drawback.



RESIDENCE OF OGDEN MILLS, ESQ.

5th avenue and 69th street, N. Y. City.

Belcourt, at Newport, as the illustrations show, offered a very unusual problem that enforced an unusual treatment. If the illustrations do not quite explain themselves, they will be sufficiently elucidated by the verbal explanation, that the building is the abode of a bachelor with a taste for horses and hospitality; that is to say, a palatial stable with an incidental apartment and an incidental ball-room. It is vigorous and direct in treatment, and successful, on the outside, where the materials are stone and brick and rough-cast, and even more in the court, where the materials are timber and rough-cast, and where a homely and effective picturesqueness is added to the frankness and directness of the exterior, by the galleried arrangement and by the free-Gothic of the detail.

I have adverted in speaking of Mr. Hunt's earlier works to the oscillations which they show from extreme formality to complete unrestraint, and how, in alternating—

From grave to gay, from lively to severe—

he has shown no trace of severity in his lively performances or of gayety in his gravity. In the works of his riper years and his practiced powers, he seems to have retained this habit, by turns to have restrained his designs in classic strictness and to have relaxed it in freer architecture. But there is this great difference between the periods that while his more formal works used to be liable to the charge of monotony, and his more exuberant works to that of restlessness, he has learned to combine his qualities, to give animation to works essentially academic, and repose to the children of his invention. The "Breakers," Mr. Cornelius Vanderbilt's house at Newport, is an entirely decorous and correct "villa in the Italian style," and in the Italian rather than in the American sense of the word, by reason of its extent and its sumptuousness; yet nobody would think of calling its decorum dull, or of saying that it lacked variety. It suffers, undoubtedly, from the restriction of space entailed upon even the finest and most extensive sites upon the cliff at Newport. But for this

restriction it seems safe to say that this also would have had more area and less height, that the subordinate rooms now relegated to the upper story would have been spread out over the ground in lower wings, and that it might have been possible to omit the third story altogether. If this had been done the "institutional" look the villa now has in some aspects, especially from the side, would have given place to a more domestic expression—if a palace can be said to be an example of domestic architecture. But this misfortune does not prevent the villa from being a very successful and imposing work. Each of its principal fronts has its own leading motive, which gives it a unity and a physiognomy of its own, while holding it strictly in keeping with the others and with the whole. It is hard to assign a preference among these fronts, each is so carefully and successfully studied and adjusted to its own central feature, whether this be the hemicycle porch of two stories with its flanking loggia, or the massive square porch with its triple arches, or the lighter and more elegant double loggia of the garden front. Each is a true architectural composition, and the whole gives forcibly the impression of a gentleman's mansion, in which the enrichment is accessory to the architectural idea, and in which the massive and monumental workmanship, so far beyond our old notions of a "sea side cottage" are merely the fitting presentation of that idea.

That is also the impression that the interiors of these palaces convey. More reserve is due, of course, in speaking of these than in speaking of the exteriors that submit themselves to the judgment of every passer. The primary impression of the great halls and the banqueting rooms of the Newport palaces is necessarily of magnificence. The untravelled American can nowhere else have received such a sense of architectural splendor as overcomes him here. But in these things also it is the intellectual, the artistic element of design that gives them value, as truly as it gives value to a picturesque shingled cottage. Mere ostentation is mere vulgarity. One



Madison avenue, N. Y. City.

BRONSON RESIDENCE.

need not go far, one need not even leave Newport, to see apartments which are merely costly, and in which the chief element of design is the design of ostentation, insomuch that the spectator wishes that the fashionable upholsterer, who remains a fashionable upholsterer even when he assumes a much more pretentious title, had had less money to spend. But in such works, if one may be pardoned the specification, as the great halls of the Breakers and Ochre Court, and as the dining-room of the Breakers, the splendor is simply the adequate execution of an artistic design. If it were

permissible to cite examples of the other kind from domestic architecture the contrast, and the explanation of it, would be self-evident. In the examples here illustrated *materiem superat opus*, in the others the material overpowers the design and luxury abolishes art. An interior which is at the same time palatial and artistic is, to quote Bacon again, rather "graced with elegance than daubed with cost." It offers matter for study as well as for astonishment, and of such, as all who know the originals will agree, are the interiors here illustrated.

It is a pleasure to enumerate the

honors by which Mr. Hunt's professional distinction has been recognized and attested, especially during these latter years, and abroad as well as at home. He has been made President of the American Institute of Architects, and of its New York Chapter; LL.D. of Harvard (1892); Honorary and Corresponding Member of the Academie des Beaux Arts, Institut de France (1883), Chevalier of the Legion of Honor (1884), Member of the Société Centrale des Architectes Français (1886), Honorary and Corresponding Member of the Royal Institute of British Architects (1886), Honorary and Corresponding Member of the Ingenieur and Architeceten Verein of Vienna (1887), Academician of St. Luke's, Rome (1892); Associate Member of the Institut de France (1893); finally, in 1893, he received what is undoubtedly the "blue ribbon" of the profession of architecture, in the Gold Medal of the Royal Institute of British Architects.

An incidental service of Mr. Hunt to his profession in the training of young architects should not be omitted from a review of his career. In his riper years his only pupil has been his son, Mr. Richard Howland Hunt, who, eight years ago, after the conclusion of his academic studies at the Boston Institute of Technology in Boston, and at the École des Beaux Arts in Paris, became associated with his father in what may be called a post-graduate course, and whose independent works show the influence and the value of that association. But in the earlier years of his practice Mr. Hunt was the first, and perhaps remains the only one of American practicing architects to convert his office into an *atelier*, in which the draughtsmen were also students, and in which systematic instruction was given to them. This education is no longer needed in view of the facilities for technical study that have been provided at home and of the increased facilities for studying abroad, but it was really a want that the young graduate of the Beaux Arts undertook to meet. That there was nothing dogmatic or magisterial in his inculca-

tions may be inferred from even the early works of his pupils, among whom were Professor Ware, Mr. Van Brunt, Mr. Post, Mr. Furness of Philadelphia, and Mr. Gambrill, until his death the partner of Richardson. The buildings of these architects, various as they are in manner and different as they are in merit, scarcely recall their teacher, except that the excesses of what we have called Mr. Hunt's staccato style, which he himself has long ago outgrown, may perhaps be traced and even in an exaggerated form, in some of the wilder works of Philadelphia. The ultimate responsibility for these erections is not light, but if any part of it could be fixed upon the teacher of the actual disturber of the peace, the teacher might, as we have seen, plead a set-off in the fact that as a teacher by example only, he has had his share in the production of the buildings that serve Philadelphia as at once ornaments and needed lessons of the value in architectural design of peace and quietness, of refinement, of harmony; the value, in a word, of careful and affectionate study. In Mr. Hunt's own work the same lesson is inculcated. It is a great satisfaction in tracing the career of an architect to be well assured, as in this case one is by internal evidence, that one is dealing with the work of an individual and not of an "office," and that the changes that one notes are the results of personal development. These pages have sufficiently shown that the changes have upon the whole been steady advances. The only emancipated graduate of the Beaux Arts coming from a scene of academic strictness and convention, considerably stricter and more conventional forty years ago, perhaps, than it is now, came upon a scene of complete architectural liberty, where there was no body of instructed opinion and no standards founded either in academic conventions or in the nature of things. It was not to be wondered at that he should have taken advantage of his sudden enfranchisement and have disported himself in some rather pranksome exuberances, in alternation with merely decorous and conventional performances. But "there is only one cure for the evils



Oakdale, L. I.

RESIDENCE OF W. K. VANDERBILT, ESQ.

which newly acquired freedom produces, and that cure is freedom." The restraint which an artist imposes upon himself of his free choice is more valuable than that which is imposed upon him from without. Hence, in some measure, it is that Mr. Hunt's career has been a steady growth, and that even now, after forty years, and at sixty-seven, one cannot say that his best work is not before him. I cannot hope that the reader will have more than a small part of the interest and pleasure in following that career that the writer has had in tracing it, but I am confident that the reader will agree with the writer that the survey in illustrations of the most typical works of his career from the beginning must greatly expand one's previous estimate of the force, range and versatility of the designer. I am sure that he will agree that the series of works here illustrated, and extending over forty fruitful years, shows an untiring zeal for a great art, a steadily increasing skill and power in its practice, and constitutes a sum of achievement honorable to the artist, of good example to his profession and creditable and useful to his country.

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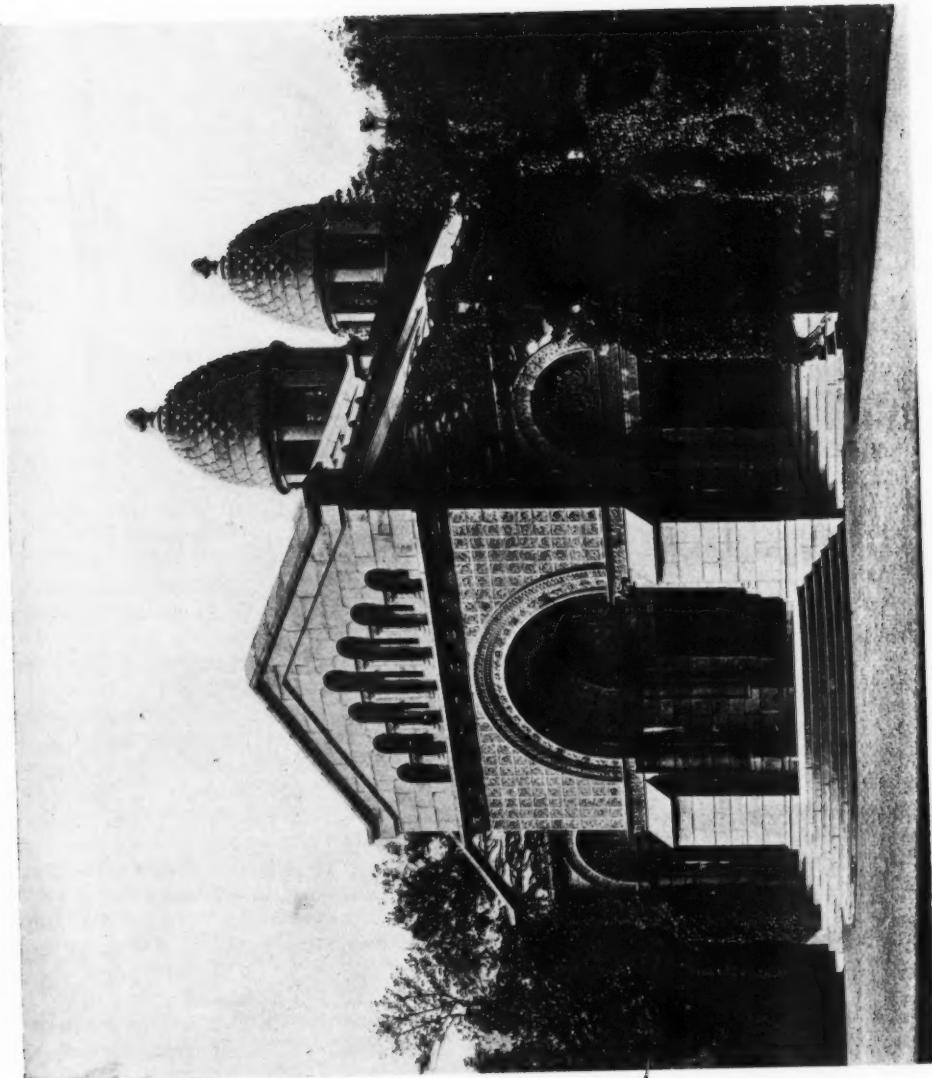
The foregoing remarks, excepting such additions as have been required by new material for illustration, were written during the lifetime of their

subject, and with the expectation that he would be among their readers. Upon looking them over, now that he can no longer be pained or pleased by whatever may be said of his work, I decide to let the form remain unmodified because it seems to me that as they stand they constitute a kind of tribute to the man, not less than to the architect. I am not conscious of having suppressed in them anything unfavorable that I had to say of any phase of his multiform activity; but I had a serene confidence that he would not take amiss any honest expression of opinion about his work, whether it happened to be favorable or unfavorable, and whether or not it happened to agree with his own. He neither had nor affected a stoical or a cynical indifference to what was thought of his work—he affected nothing—but he felt that it was the work that availed and not what was said of it. I heard him say once, in speaking of some published strictures upon a building of his: "I can't help it; I do my best."

That this is true the preceding pages have borne ample witness. Indeed, nothing could be more admirable or more enviable than the zest with which to the last he attacked a new problem—the freshness and the freedom from any suggestion of jaded or perfunctory work as complete as if he had never designed a building before. Of course this argues not only an unusual

THE VANDERBILT MAUSOLEUM.

New Dorp, S. I.





THE LATE RICHARD MORRIS HUNT.

conscientiousness but also an unusual vitality. His vitality, indeed, exuberant in the work of his youth and his middle life, formed a large element, not only in his work but in his personality, long after he had come to be recognized as a senior in his profession; insomuch that it was only within the last year or two that he made at all the impression of an old man.

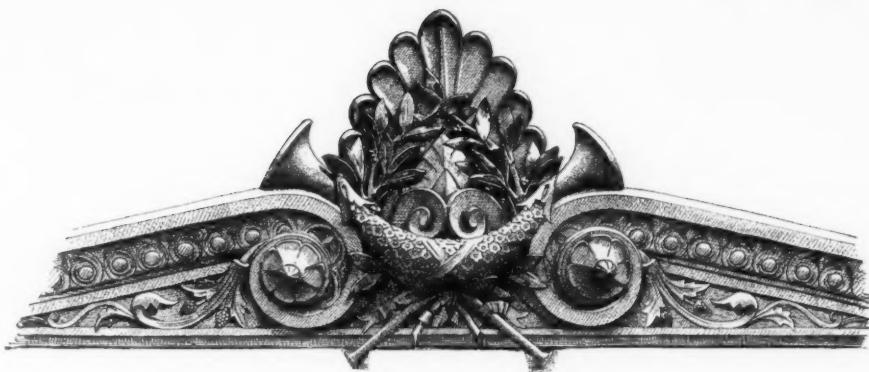
A directness amounting sometimes to abruptness in Mr. Hunt's manner used to puzzle and sometimes to displease strangers. But it did not take an intelligent stranger long to perceive that this was the expression of a perfectly unaffected simplicity and of a perfectly transparent honesty. Indeed, his honesty was so transparent that it was quite impossible to conceive of him—I will not say as engaged in anything like intrigue, but as taking any but the most direct and straightforward way to his objects. His simplicity was so unaffected that he was quite the only man I have ever heard speak to a hundred people exactly as he would have spoken to one of them, which, of course, is as different as possible from the commoner practice of speaking to one man as you would speak to a hundred.

The frankness and directness that were the expression of his transparent honesty were often accompanied by a

humorous or whimsical extravagance of statement that was equally the expression of his exuberant vitality. This also often puzzled strangers, and led them to believe that the famous architect could not be a "safe" man. But this wrong impression also was very soon dispelled. In fact, the good sense, the moderation and the judicial temper that underlay this extravagance so impressed themselves upon all who came to know him that they esteemed him as an eminently safe counsellor; and it was these qualities that so very often led to the choice of him, in bodies composed not only of men of his own profession, but of men of various callings, as the presiding officer, or what in some ecclesiastical gatherings is happily called the "moderator." It was this that led him to be regarded as the *doyen* and representative of his profession before he had attained that place by seniority of years or service; this and his unselfish devotion to the interest of that profession, as was conspicuously shown in his latest years by the labor he underwent in order to have the public architecture placed on a more rational and honorable footing. To know him in person as well as in his works was to heighten one's appreciation of him, for it was to receive, behind the architect, "assurance of A MAN."

Montgomery Schuyler.





NEW BOOKS.

Épidaure, Restauration et Description des Principaux Monuments du Sanctuaire d'Asclépios Relèves et Restauration. Par Alphonse Defrasse ; texte par Henri Lechat. Paris : Ancienne Maison Quentin. 1895. Small folio, pp. IV., 246. 13 plates, of which one is quadruple, one triple and five double ; 78 illustrations in the text.

The sacred inclosure of Asklepios at Epidauros, on the eastern coast of the Morea, near the modern Epidavra, has been the scene of long continued researches by the Athens Archaeological Society. Beginning about 1881, these excavations have been the subject of a long series of papers in Greek, French, German, English and American journals devoted to archaeology. The stadium or inclosure for foot races and the theatre, both outside the sacred inclosure, have also been the subject of minute investigation. The theatre is of especial importance on account of the extraordinary preservation of the rows of seats, although the buildings connected with the stage are entirely in ruins. The present book comes to record in a permanent shape these new discoveries and many of the theories which students have formed with regard to them. It is a very handsome book of the true Parisian type, with large plates photographically reproduced by Dujardin from highly-finished drawings made in the true style of l'École des Beaux Arts and with many photographs of sculpture and other details in the text. It is printed in large type on thick paper, and is as we had to say of Mr. Havard's book on Galland, a small or middle-sized book made large. It is rich in material for the architectural student and practitioner, material both literary and in trustworthy drawings.

Messrs. Defrasse and Lechat are, the one a former *prix-de-Rome* student and an architect,

the other a former member of the French school at Athens and a lecturer of the National Faculté des Lettres. The drawings are by Mr. Defrasse, and it appears that some of them have formed a part of his *Envoi de Rome*. The preface explains how such drawings of record and restoration are required of the privileged students at the Villa Medici, and how hard it is to make permanent use of them, because of their great size and their constantly increasing numbers ; and how, finally, this book is part of a serious attempt to make them useful.

The Hieron or sacred inclosure can be perfectly identified and its boundaries marked out. There are belonging to it the foundations of the propylaea or monumental gateway, which seems to have inspired but little interest in the explorers ; ruins of a peripteral temple of no great size, but of admirable workmanship and easy to recognize as the shrine of the God of Healing to whom the place was sacred ; ruins of a round building which is at once identified with the tholos described by Pausanias ; of a long portico; of a temple of simpler plan (not peripteral) and of similar small scale; and of several buildings of later date. The stadium is outside the inclosure and has been little explored. The theatre is five hundred yards away and has been the subject of separate excavations. A small building for the storage of the sculptures discovered has been built close to the theatre and a new road has been laid out from Epidavra to Nauplia, giving easy access to the ruins, but avoiding interference with them.

A whole chapter of the text and many illustrations are devoted to the temple supposed to be that of Asklepios. It is not of novel distribution or design, a hexastyle temple with this one important peculiarity, that the columns on the

flank were only eleven in number instead of being twice as many as in front and one more than that is thirteen. Nothing new is gained in information about temple roofs; the old question of lighting from above—was there any or was there not?—is left unsolved so far as these ruins are concerned. The inclosed part is unusually simple, consisting of one large room only, in the west end of which the authors think they have a right to place the chryselephantine statue described by Pausanias, and a shallow prostasis or vestibule. The greater part of the structure was of tufa of fine grain and solid, but it had been covered everywhere with a thin coat of the finest white stucco upon which color had been freely applied, with many delicately drawn patterns of ornament of which traces remain. The metopes were not sculptured, so far as can be judged by the fragments which remain, which appear to be abundant for purposes of judgment. The pediments, on the other hand, were filled with sculpture of pentelic marble. Judging by the places where the sculptures were found, it is evident, thinks Mr. Kavvadias, Ephor of Antiquities, and the scholar who has written the most on these discoveries, that nearly all the sculptures found belong to the western front. These seem to have represented the well-known battle of Greeks and Amazons. The fragments shown in the photographic pictures of the text are of great beauty, and they are sufficient in number to have made possible a tentative restoration of the one pediment group, but it is assumed that some of these sculptures were set upon the roof above the pediment in guise of acroterial ornaments, and this makes more doubtful the distribution of the rest. A large elevation, plate III., offers a restoration of one of the fronts, which is the east front, so far as having the vestibule and door, but the west front so far as the pediment is concerned. The text explains at length the authors' reasons for every step which they have taken in this restoration, and the reasons for the anomalous combination of the two fronts in one. An outline print, on page 55, is nearly on the same scale as the restoration and is elaborately figured. From this and from the text it appears that, with regard to the architecture proper, the one important point which is still doubtful is the exact height of the columns; but the text explains (p. 54) that the error cannot exceed a few centimetres either way. With regard to the columns a curious confirmation is noted (p. 56, note) of the theory that the drums of columns were made to fit closely by being ground together. Remains of a red mortar,

plaster or similar paste adhering to the beds show the traces of a rotary movement imparted to the upper drum. It must be mentioned also that inscriptions have been found which give very curious details concerning the ceiling, the unexpected and inexplicable outer door which must have been hung between the columns of the vestibule, and the inner door of boxwood and ivory; also the cost of materials and the rate of pay of architect and workmen.

In the temple of Asklepios, then, we have one more hexastyle peripteral Greek temple of nearly normal type, well worthy of study, as every newly found Greek building must be, but not very novel. Very different is the case with the ruins of the tholos. Here is a circular building with a ring of twenty-six Doric columns outside the wall of the sekos and a ring of fourteen Corinthian columns within, and no doubt can exist that it is a building of the epoch commonly assigned to it, or about 350 to 310 B. C. It is, therefore, contemporary with that building which has been supposed to be the one example of the Corinthian style in continental Greece, namely, the Choragic monument of Lysicrates. The Corinthian capitals of Epidavros are, however, greatly superior to those of the Athens building, which latter it must be remembered was a little monument about seven feet in diameter, its columns, six in number, engaged in a solid wall. According to the restorations of more recent times, as well as the drawing made by James Stuart in the last century, the Athens capital is lacking in dignity and appropriateness of design considered as a supporting member; faults excusable enough in the fanciful little structure which it adorned, but so serious from another point of view that it is commonly thought useless to go back of Roman examples for the true type of the Corinthian order. Here at Epidavros, however, the order is found in perfection and easy to restore. There is one very curious incident in this exploration which must be mentioned. A Corinthian capital of marble and of the proper size for the tholos order has been found by Mr. Kavvadias carefully buried in the neighborhood of the building. This has never been finished, but the sculpture of the leafage is done with the utmost refinement; and there is this unexpected feature about it, that the leaflets of the acanthus of the lower ring have sometimes five, sometimes six, sometimes seven points, as if the designer were trying experiments in the most thorough fashion, that is on the marble itself and of the full size. Our authors give a large untouched photograph (page 115), and of this they

insist upon their view that this was a model capital, not to be used, but to be kept as a guide for the marble cutters.

In the book under consideration the tholos is restored as a superb spring house—that is, as the rich inclosure and shrine of the sacred well of Asklepios. They are led to this partly by the curious substructure which supported the flooring and partly by the evidence, which they think sufficient, that the building was practically unroofed within the ring of Corinthian columns. Some moulded courses of tufa found on the ground aid in the restoration of the building, according to this theory, by furnishing the evidence for an attic wall rising above the roof of the outer pteroma. The reader is to imagine, then, a circular colonnade of Doric columns as refined in their proportions as any known to us, and with an entablature of unusual splendor; within this the cylindrical wall of the sekos, which also rises above the colonnade and its roof in a decorative attic. Authentic or not, or, to speak more justly, whether more or less authentic, the restoration according to this scheme, which is to be seen in plate XII., will charm the architect as a new revelation of what Greek architecture of the prime could achieve.

There seems to be little doubt concerning the interior or Corinthian order, whether in detail or in general design. Moreover the ceiling of the outer pteroma and that of what may be called the inner pteroma, that is the narrow space between the sekos wall and the inner colonnade, are certainly capable of restoration and probably to be restored nearly as Mr. Defrasse has shown them (page 118). All this depends of course upon the number, size and preservation of the fragments existing. The restoration of the marble-tiled floor as a ring around a broad well-mouth is perhaps doubtful, in view of the absence of any fragments which might have belonged to the well-curb; this particular restoration follows from their assumption of a spring-house beneath and from the facts stated by Mr. Lechat that the marble tiling of the floor is known in its completeness, and was not continuous over the central portion.

It may be said here, once for all, that our authors give the reasons for every step in their restoration. It is evident that architect and writer are of one mind and that they know how to discriminate between the nearly certain and the merely probable. The absence of any flow of water now need excite no surprise in view of the earthquake so common in Greece.

The Ionic portico lying to the north of the

tholos and stretching more than two hundred feet from east to west, Mr. Defrasse restores as the sheltered sleeping place, closed on the north and open to the south, for those who came to consult the God of Healing. The building was evidently a piece of delicate and severe Ionic, and the mouldings of the bases are of singular flatness. One-half of this portico was, as our authors think, of the best Greek epoch; the other half with a substructure of the Roman time and with its details closely copied from the Greek originals. The little temple thought to be that of Artemis was hexastyle and prostyle and built with an interior order unusual in so small a structure. All the details, as seen in the fragments recovered, are of great beauty and perfect finish. There seems to have been three statues, one of the well-known "Victory" type, and the others probably Neriads mounted on sea-horses found among the ruins of this temple, and our authors place them upon the roof as acroterial statues. The propylaea was of good Doric style and well-worthy of consideration for its plan is of a wholly open portico; Doric without, Ionic within, in a way that reminds one of its Athenian prototype. Finally the theatre, however important to archaeologists as the best-preserved one in Greece, offers to the architect nothing else so valuable as the Ionic order along the front of the stage and the admirable pilasters and entablature of the principal doorways. These details are the best hint at Greek domestic architecture of the decorative sort that we are likely to find. The height of the hypskene or room under the stage was that of a common modern story, ten feet or a little more "between beams," and all these carefully designed and delicately executed columns, pilasters, door-pieces, niche-like recesses and the rest are exquisitely adapted to that small scale of the building. The architect will find some novelties here, too, in the way of mouldings and their combination.

Inigo Jones and Wren; or, The Rise and Decline of Modern Architecture in England.
By W. J. Loftie. Macmillan. 1893.

Four chapters of the eight into which this work is divided and 106 of its 270 pages are devoted to an account of architecture in England between the latter days of the Gothic style and the appearance of Inigo Jones as an architectural designer in England, about 1615. The remaining part is subdivided as follows: Chapter V., Inigo Jones, 50 pages; Chapters VI. and VII., Wren, 60 pages; Chapter VIII., the successors of Wren, 55 pages.

The whole book is devoted, all the chapters alike, to a vigorous philippic against all other styles of building in modern use except that which the author calls Palladian. This term he applies as readily to one form of revived classic as to another; for, although he is aware (page 79) that Palladio had nothing to do with the early appearance of the classical Renaissance in England, and even that he "was probably not yet born," and although he knows of a modern "Grecian" style (p. 279) which also is not Palladian, yet we find the Elizabethan modifications of mediæval art qualified by this latter epithet. The author is not, however, to be held to this: he is aware that Palladian is a different thing from Elizabethan architecture, and says that Caius College, at Cambridge, built about 1655, is the first distinctly Palladian building in England; but he is still in trouble about that mixture of Italian classical feeling with English methods which makes up the Elizabethan style, and which we can date as from 1560 to about 1610. The great gallery of Haddon Hall has an Elizabethan wainscoting well known to the students of English architecture, whether in itself or by means of photograph, and this wainscoting is said (page 56) to show the gradual approach of the Palladian style. "Something very like a composite capital crowns each pilaster." The expression "later Palladian" occurs continually as an equivalent for the complete Italian revived classic, with "the use of the orders," as our author says in more than one place, and this appears to signify the Palladian of Palladio—that is to say, that form of the revived classic style which may be supposed to have sprung from the study of that great architect's buildings and books. Mr. Loftie seems to be feeling about for a term which will convey to his readers an idea of what he loves in architecture; the orderly and formal buildings of the later Italian styles beginning in Italy about 1525; a century after the beginning of the Renaissance. These styles, which the Italians call the *classicismo* and the *decadenza*, but never by any chance the *rinascimento*, Mr. Loftie identifies, in the first place, with the work of the two architects which form his principal subject; in the second place, with the architecture of proportion as distinguished from that of decorative detail; and in the third place, with all that is good in what he calls on his title page "Modern Architecture in England." There is, as the reader may guess, great confusion of thought throughout the book, which is written, as the author states in his preface, not by an architect nor for architects, but by one of a profession "the members of which as

a class give the most employment to architects." He is in short a clergyman who has written on art and archaeology for different English periodicals, and in connection with Mr. Freeman's series of "Historic Towns"; besides his own "History of London," Westminster Abbey," etc.

Why does he call this formal architecture, suggested as it were by Jones in a part of his work, followed by Wren at a time when all the architects of Europe were following the same course two hundred years ago—a style, moreover, which was almost wholly abandoned with the beginning of the reign of Victoria, which reign is now sixty years old;—why does he call this style modern architecture? He explains in his preface that he adopts the word Palladian because the word renaissance is not sufficiently definite, and has a foreign sound, because Palladian conveys a definite idea, while "Queen Anne" has a limited, and "Italian" an unlimited meaning, and because Palladio especially represents learned or classical art in England. Here is indicated a lack of clear perception. Neither term is used in an exact or truly descriptive way, and indeed they are hard words to use or define.

There is, however, one truth which our author sees clearly and insists upon in fitting language; the truth that the Gothic revival in England has been a complete failure. When the present writer said in print and on more than one occasion twenty years ago that the Gothic revival had failed in England the assertion was met with scornful denial. It will probably not seem rash to the reader of Mr. Loftie's pages. When it became evident that the imitation of ancient styles of the Middle Ages was not leading to any living and generally recognized style among the moderns, the failure of the Gothic revival was visible to those who would look. It did not follow from the cleaning up and putting in order of ancient Gothic buildings, nor from the close imitation of them in the erection of new ones, that the Gothic style was really in the way of being revived. While one architect was building a careful study of "early English," another a church in which were combined Flemish details with the use of colored material taken from the north of Italy, a third a good solid round-arched structure which he called Norman, and a fourth a faithful imitation of Henry the Seventh's chapel at Westminster; while these imitative structures were going up, with no attempt to construct or to carve as the original builder had done, and with only here and there a scarcely recognized piece of thoughtful designing was being brought into existence, the Gothic revival could not be

said to have succeeded. It was not for the building of imitative buildings, even the most faithfully imitative of some Middle Age style, while beside them as many buildings imitative of Italian, French or German revived classic were going up, that the early Gothic revivalists worked and wrote. Mr. Loftie is right about this; the Gothic revival has failed, and he would have been right had he gone on to draw a conclusion from this failure, and had assumed that where this very earnest and zealous attempt had failed other attempts would fail, and that all this galvanizing of the dead corpses of styles of art would end in such chaos as we see all about us.

No one could have been expected to foresee this. In 1840 when the Houses of Parliament were begun, in 1850 when All Saints' Church in Margaret street, London, was begun, in 1857 or 1858 when the New Museum at Oxford was begun, there was room for hope. Had a reasonable proportion of the architects worked with the energetic good-will of Barry, with the decorative sense and proper independence within the limits of his style of Butterfield, or with the devoted belief in the future of Deane, there would have been reason for hope. A style might have grown out of such designing as either Butterworth's or Deane's. That their efforts should result in no formation of a school; that their work should pass as clever and original building, to be mentioned in guide-books, but should never work any change in other men's work, nor tell as one step in the building up of a new and universal style of architecture; that could never have been foretold.

Mr. Loftie is right, too, in insisting upon it that the great fault of modern architecture is lack of proportion. There can be no doubt that the way to make something of our business buildings, where rentable space and abundant light everywhere are the requirements, is this: to work out, in slow hours of application, a system of proportion fitted to their novel conditions. Mr. Loftie's mistake seems to be in thinking that decorative detail is in some way hostile to good proportion. The buildings which he greatly admires are certainly devoid of ornamental detail; it is also true that when their proportions are good this fact is plainly visible, because, if they have proportion or if they have it not, they have nothing else. Thus old Burlington House, in London, engraved page 247, from *Vitruvius Britannicus*, is mentioned with the praise which it partly deserves; but it is treated also as if it were, because of its proportions, thoroughly good architecture. On page

230 Sir William Chambers is quoted as having said of it 'Behind an old brick wall in Piccadilly there is, notwithstanding its faults, one of the finest pieces of architecture in Europe.' This, however, is not the case. No building can be one of the finest pieces of architecture in Europe which contains nothing but carefully arranged windows alternating with piers, columns alternating with open spaces between them and a proportion of basement, principal story and entablature with parapet. To design such a front is to produce academic architecture and nothing more. The merit of the designer is wholly in the single elevation drawn on the sheet of paper. It is a good architectural composition, but it is not good architecture nor architecture in a high sense at all. Where is the adaptation of the exterior to the plans? Where is the evidence that the plans were considered at all? Where is the evidence that any difficulties of construction were met and vanquished? Where is the evidence that the building erected as a London dwelling is in any way different from the Italian palace or palaces which it imitated?

Is it even a piece of faultless proportion? The principal story has between its two projecting wings seven large windows of equal size and equally spaced. The basement has below these seven openings, arranged of course on the same axes with them. Now the central opening of the basement is a door and is made wider than the windows of the same story, and the result is that the two piers flanking the said door are narrower than the other piers of the same story. In two ways this works badly; in the first place, it gives a huddled effect, than which nothing could be more disastrous to a Palladian front, and, in the second place, it throws the piers off the axes of the regularly spaced columns above, so that these piers seem, in the otherwise exactly spaced façade, to be unduly loaded on one side and to be in danger of sinking on that side. There is to be seen in this piece of awkwardness the penalty which attends the use of this formal style of building. It is lost—your design is lost—if the least suggestion of utility is allowed to be heard. The style to which old Burlington House belonged, to which St. Paul's in London belongs, the style in which abstract proportions are everything, and the designer does not ask how he can bend the requirements of his design to his will, but how he can ignore requirements and make the design without considering them—that style can only succeed when all matters of utility and convenience can be made to give way. It must, therefore, be used on a

colossal scale and with abundant means, or it will fail. Burlington House was small; each bay of its front was only 11 feet 6 inches between the axes; when, therefore, it was necessary to pierce one of these bays with a door, everything was thrown out of scale and the design spoilt, and yet the door was but a narrow one. Again, the windows of the principal story rise only twelve feet from the floor to their heads. Whatever the height of the apartments may be, this is inadequate; rooms lighted with such windows cannot but look petty. Again, there is no opportunity for another story upon this front. The Palladian style, as understood in England, recognizes only one story and a basement, and rightly so, for nothing can be more unfortunate than the super-imposition of story upon story when the style is treated with any richness of detail—when it is anything more than a blank wall pierced with square holes.

Strangely enough, Mr. Loftie seems to see, as is shown at the very close of his book, one of the weak sides of his beloved Palladian. He tells of "grand buildings in Pall Mall, Regent street and Regent's Park," which were favorably criticised in 1825 and which are imposing on paper, but which are not real, which "stand to architecture as scene-painting stands to landscape," and which, in short, were composed of Portland cement and the like with the capitals and mouldings cast. He tells an excellent anecdote of the notice in a guide book of a new building in the Grecian Doric style, with minute description of its details, and of his visit to the building in question. "I found an ordinary little Dissenters' meeting house," Mr. Loftie says, and adds, "but the description was perfectly correct." We have all experienced the same thing. Here in New York we were all sent a year ago to look at the little Hall of Records because of its merit as a perfect piece of Roman Ionic. That building indeed is not built of stucco; it is, however, of the class of buildings which entirely fills the requirements of "Palladian architecture," and which has no value whatever. The use of inferior materials began with Palladio's own practice, for his stately palaces at Vicenza are chiefly of stucco; it was carried on by Wren whose vaulted roofs in his London churches are of lath and plaster hung from the framing above. It is not inconsistent with the style which is essentially and in its very nature "scene-painting" and not architecture. A building may be insignificant in size, base in its materials, devoid of constructional value, or of adaptation of means to end, uninteresting and unimpressive

and yet offer to the spectator an entirely formal and sufficient specimen of what is called Palladian design.

Architecture for General Readers. A Short Treatise on the Principles and Motives of Architectural Design, with a Historical Sketch. By H. Heathcote Statham, Fellow of the Institute of Architects; Editor of the *Builder*. With illustrations drawn by the author. Imported by Charles Scribner's Sons. 1895.

It is the London weekly journal, the original *Builder*, of which Mr. Statham is editor, and it is the Royal Institute of British Architects, of which he is a fellow; a point worth noting, since the American National Association of Architects has unfortunately adopted the English name of "Institute." Mr. Statham is an architectural draughtsman of ability, as is shown in the drawing of St. Paul's Cathedral reproduced in the book on English Cathedrals lately reviewed in these columns.* The same drawing is given as the frontispiece of the present work, and is here more agreeable to the eye than in its larger form and perhaps equally explanatory of the design. Another drawing by the author, the west front of Tewksbury Abbey, is inserted at page 201, and is a very beautiful and faithful piece of architectural reproduction. It is the more fortunate that these drawings are given, because the illustrations immediately connected with the text are not pleasing nor very intelligible.

The first thing for the reader to do is to make for himself a table of the chapters, and this will show that there is no chapter I., but instead of it a general essay headed with the title of the book. Chapter II. deals with Trabeated Architecture, or that of post and beam, wall and flat roof; Chapter III. takes up Arcuated Architecture, or that of the arch and vault and their abutments; Chapter IV. is devoted to Mouldings; Chapter V. to Ornament other than Mouldings, and Chapter VI. is entitled "Architecture in Connection with Cities and Landscape." Finally, a Historical Sketch begins at page 201 and occupies 120 pages. It will be seen that this is eminently a book for the general reader, as indeed its title asserts, and not one intended for the student. For the purpose of such a guide to knowledge and right judgment it is an excellent treatise; sensible, logical, sufficiently full in its citation of instances

* It is a matter of regret that that drawing was not mentioned in our notice. The other drawings compared were of Gothic buildings, and this of a classical structure was therefore passed by.

R. S.

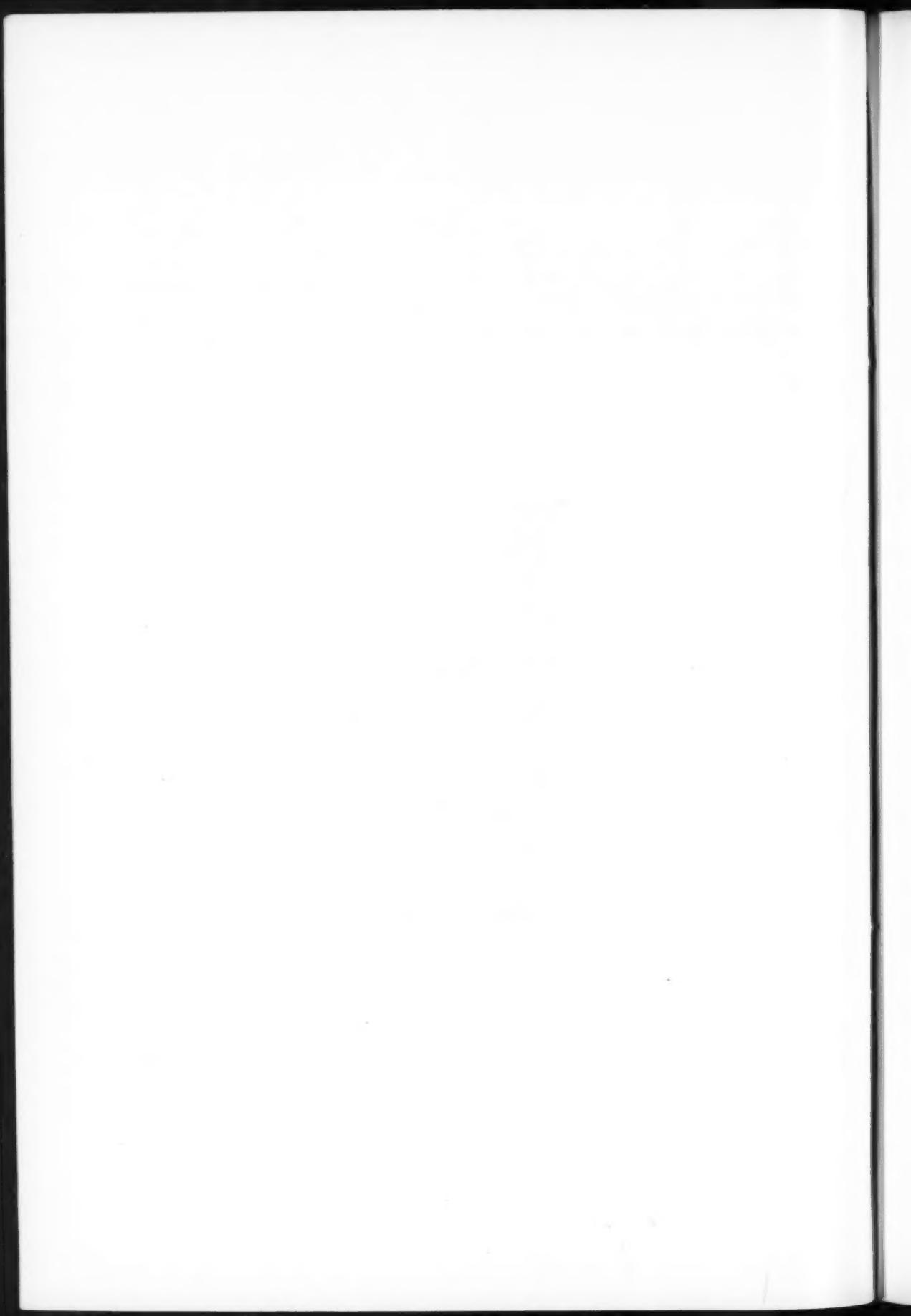
and examples, sure to direct its readers aright. The things we miss as we read it are seen, on reflection, to be the things that had to be left out of so small a book.

No student other than an Englishman can be expected to allow so much relative importance to English Gothic. No student of the structural history of Gothic art can fail to be surprised at the insistence on ideas of verticality and aspiration as being of great weight with the builders of the twelfth and thirteenth cen-

turies. Constructional and not sentimental influences were what governed them. And, in the too brief account of architecture since the Renaissance, one asks for more recognition of that feeling of delicacy of proportion among the parts of a building, which feeling is the good element in the existing school of modern Roman or late classical revivalists. But these are matters concerning which it is evident that different writers will hold very different views. The book before us will lead no one far astray.

Russell Sturgis.







Technical Department.

ARTISTIC STONE CARVING.

THE work of the late Richard M. Hunt possesses an especial interest other than that arising from the quality of design. Probably no architect of his day was so little hampered in the execution of his artistic conceptions by those hard financial restrictions which tame, if they do not maim, the imagination of the ordinary practitioner of the art. He was remarkably fortunate in the fact that in all his important work the consideration of cost was one of the very last conditions to be counted with. The means at his command were usually so abundant that almost as a matter of course he obtained the highest resources of the professions, crafts and trades, which are the necessary auxiliaries of the architect. But, moreover, Mr. Hunt was a fastidious critic in all the branches of construction and decoration, and was particularly scrupulous in intrusting his designs to none but the most competent hands. There was no necessity to employ the second best or to experiment with substitutes, so that the office of the architect became in a sense one of the highest centres of the building art of the day. It is this fact which gives Mr. Hunt's work a technical value beyond its æsthetic worth and makes it an interesting study from a second point of view. It exemplifies the highest standard of craftsmanship in the United States, both in workmanship and in method.

It is, of course, clean impossible to illustrate these matters by engravings. The technical perfection of any example of the industrial arts is not to be shown in a picture, and, indeed, the higher qualities of, for instance, wood-carving or stone-carving or metal work

are rarely directly appreciated by even the intelligent but uninstructed observer. These qualities are recognized by him undoubtedly, but only in the force of the general impression which he receives. The trained artisan only can fully appreciate the great technical skill, the long preparatory practice necessary to produce some small detail, or perhaps emphasis of detail, unobtrusive in itself, but immensely telling in the total effect of the work. A great deal of the work in Mr. Hunt's buildings is as admirable on the technical side as on the æsthetic, and it is unfortunate that more cannot be done here than merely indicate some of the more notable successes which the interested reader is invited to study in the buildings themselves.

A glance at the preceding illustrations of exteriors and interiors shows a great wealth of carving in stone and wood, especially in the later and more important works of Mr. Hunt. Artistically and technically it is the finest in this country and will compare favorably with the best anywhere. Indeed, the work in the Vanderbilt residence, on Fifth avenue and Fifty-second street, inaugurated a new era of stone-carving in America, and Ellin, Kitson & Co., foot of West Twenty-fifth street, New York City, to whom this important detail of the design was intrusted, deserve special recognition for this fact, particularly as their assistance was subsequently relied upon by Mr. Hunt in all his greater operations. The order of work done by this firm is so high that it is easily typical of the very best obtainable to-day. In the Vanderbilt residence referred to they did all the fine exterior stone-

carving, as well as the carving of the main hall and staircase and of the banqueting hall. It may be well to observe that the main hall and staircase is of Caen stone and is entirely carved from floor to ceiling in the French Renaissance style. The staircase particularly is elaborate and rich, and at the time when completed far surpassed anything of a similar kind so far attempted in this country. Visitors to this sumptuous mansion need not be reminded of the beauties of the banqueting hall, one of the noblest apartments in the metropolis. The more noticeable features of this room are the wainscoting, seven feet high, of oak, the vaulted ceiling, also of oak, and the great red sandstone mantel, with its six full-sized figures. For all of these Ellin, Kitson & Co. are to be credited.

But if this be the earlier work, the reader, by turning to the illustrations of Ochre Court, the residence of Mr. Ogden Goelet at Newport, will see in the pictures of the main hall and the staircase hall good representations of some of the latest work done by this firm. Much of the finer detail is naturally lost in illustrations like these, which present rather a general view than a picture of minute particulars, but enough is shown to give the reader a good idea of the rare fineness of execution and the artistic elaboration of this work. The entire staircase hall is constructed of Caen stone all the way to the ceiling, about thirty-five feet high, the ceiling itself being of ornamental plaster splendidly enriched, as the engravings show. In the main hall all the stone, wood and plaster work was done by Ellin, Kitson & Co. A decidedly Gothic feeling pervades the work. Stone is employed for twenty feet of the height, and at the top of this, all around the hall, is what may safely be pronounced the finest piece of

wood-carving in this country. Every square inch of this superb work was produced by the firm in their shop, and it shows the high perfection which American workers in wood can attain to under the most favorable conditions.

The "Breakers," perhaps the most sumptuous of the great Newport cottages, was also, in large part, intrusted to the hands of Messrs. Ellin, Kitson & Co., and the work they have done there has received the admiration of the most critical. Their chief contributions to this palatial house are the main hall and the staircase hall. Both are carried out in Caen stone to a height of thirty-two feet. The illustrations give one an accurate and sufficient notion of the elaborate splendor of these apartments, which are unmatched in this country and recall in no unworthy way the very finest of the great show places of Europe. The fine ceilings in both the main hall and the staircase hall are worth particular attention. Some idea of the extent of the work called for in this building may be gathered from the fact that the carving and cutting done required from twelve to fifteen months for execution, and at times over two hundred men were in employment. The entrance hall of this building, wrought in stone and marble, was also the work of this firm.

Besides the Newport residences, Messrs. Ellin, Kitson & Co. did the entrance hall of the Gerry House, in New York City, and the outside stone-carving—in the hard brownstone from Rochester—in the Marquand residence, also in New York City.

This dry enumeration of details merely indicates the honorable position which this firm has taken in the development of their branch of the building craft. Their work deserves study as an "ensample" of the highest methods.

MODERN STONEWORK

No people ever believed in their own age so heartily as we do in ours. Progress is supposed by everybody to underlie all our activities. The thing done to-day must necessarily be performed better than the thing accomplished yesterday.

This is a very comfortable assumption. It is so thoroughly accepted that any one who calls it into question is at once labeled with a bad name, and regarded as a cynic or a pessimist, or something equally odious. In the building trades, particularly, it is an article of faith that progress has been moving along with the succession of day after day. We are supposed never to have halted, never to have retrograded.

There is, of course, a great deal to create and warrant this belief. The application of mechanical power to building has made possible a great many wonderful things, all carried on right under our eyes. The adoption of iron in construction has been revolutionary. The discovery of artificial hydraulic cement, too, was a great addition to the builders' craft, and—equal to anything else—the greater pressure at which this age carries on all its work has increased both the necessities and the possibilities of construction. Indeed, there is no wonder that we all firmly believe that building science is in a very much more advanced state to-day than it has ever been before in the history of the world—the belief is supported by so large a number of facts.

There are certain directions, however, in which the reality of progress cannot be conceded unreservedly. It is doubtful, for instance, whether in all particulars, modern mason-work can advantageously be compared with the best mason-work of mediæval times, with that of the Romans or the Greeks, or with that of other great builders who preceded the Middle Ages.

For instance, to take one of the oldest pieces of masonry-work in the world, the great Pyramid of Khufu in Egypt. Recent investigators assert that the stone in this colossal structure is set with a mathematical exactness, which can be compared only to the

finest achievements of our opticians. Ever since the Parthenon received scientific study, it has been the admiration of architects for its splendid stonework, in which, as is well known, are embodied minutest subtleties of form which the ordinary eye is unable to detect unaided by instruments. The masonry of the Romans remains to this day in great quantity bearing witness to its own excellent construction. How the Gothic builders triumphed over the hazards of vaulting and other similar problems is exemplified in the great European cathedrals.

In more modern times, after the great buildings of the Renaissance, the art of the mason seems to have distinctly declined. The greatest triumphs of our own day have been achieved rather in iron construction than in mason-work. In the United States especially, the masons' craft was for a long time in a decidedly low condition. Perhaps this was natural, as the history of American building began with the carpenter and the frame house, and was almost completely in the carpenters' hands until the beginning of the present century. It was the growth of our cities about this period that brought the mason to the fore in the more general use of brick and stone. For years, however, brick was the dominant material, despite the immense wealth of stone which this country possesses in almost every section of it.

No country in the world is so rich in building stone as the United States, or possesses anything like the variety, yet, at first, and indeed almost down to the present day, strictly first-class masonry was rather an exception than a rule in the United States. Even in New York City isn't it only yesterday that builders, generally speaking, departed from the malpractice of setting stone contrary to the natural bed? The advent of the tall building, the "sky-scraper," so called, may be said to have brought in the new era of high-class masonry by not only permitting but necessitating the very highest and most scientific methods and practices.

Moreover, a class of masons has

arisen with us as different from the old order as the architect of to-day is from the old carpenter-architect of the first quarter of this century. These men follow their craft in a scientific way. They possess experience and means. They have gathered around them a body of skilled workmen who are competent to meet the most exacting demands of the architect, and one needs very little technical knowledge to be aware of how exacting these demands are. The marshaling together of the materials that enter into the construction of a large modern building may be likened for difficulty to the mobilization of an army, and in this process certainly the part which the mason plays is the most exacting. From the selection of the stone in the quarry to the placing of the final course in a building (perhaps two or even three hundred feet above the street level) skill and executive ability of a very high order are imperative. Abundant capital, of course, is necessary, and an experience which cannot fall to the lot of many men. Indeed, to-day there are only a few mason firms to whom architects can fearlessly trust the most important work they are called upon to carry out.

Among the firms that stand unquestionably in the front rank is that of James Sinclair & Company, of No. 413 East 29th street, New York City. The late Richard M. Hunt confided the stone-work in nearly all his greater designs illustrated in this magazine to this firm, which thus has the credit of adding their experience and skill to the erection of what are, perhaps, the most palatial homes built anywhere in recent years.

The work which they have performed on these buildings has received and deserves the very highest compliments. In the domestic field there is nothing to match it in this country. It was Sinclair & Company who were intrusted with the stone-work of the W. K. Vanderbilt residence, on 5th avenue and 52d street—a building which marked the new era in sumptuous town residences. The fact that a firm worked on this building is *prima facie* evidence that it enjoyed the highest reputation of the time. The firm has

continued to hold the same ever since, a fact which is sufficiently indicated by Mr. Hunt's selection of it in the construction of "The Breakers," the "Marble House" and "Ochre Court" at Newport. The stone-work in these superb palaces is unsurpassed. It represents the very highest results obtainable to-day. The "Breakers" is of buff Indiana stone, the "Marble House" of Tuckahoe marble, and "Ochre Court" of blue Indiana stone. The material was selected with the utmost care, and was chosen by Mr. Hunt to produce the highest effects of his designs.

The most important piece of work, however, that Mr. Hunt intrusted to Messrs. J. Sinclair & Company was that of Biltmore House at Asheville, N. C.—the superb château in the style of Francis the First, built for Mr. George W. Vanderbilt. This is by far the most sumptuous home built within the last quarter of a century. In size and magnificence it rivals its French prototypes. It is essentially a palace. No money was spared in its erection. The highest workmanship procurable was employed, and it must be very flattering to Messrs. J. Sinclair & Company to find they were selected above all their other competitors for this important piece of work, for in this building it is well known Mr. Hunt called to his aid none whose position and character did not entitle them to the most unreserved confidence. Biltmore House was the most important commission the architect received in the course of his career. Many consider it his *chef d'œuvre*. But however much opinion may differ upon the artistic position which this building occupied in the list of Mr. Hunt's works, no one questions that constructively, it was his most important building of a domestic character. The material used was buff Indiana stone, and for the detail of the work we refer our readers to the engravings at the commencement of this volume. This building has added greatly to the reputation of Messrs. J. Sinclair & Company. It is a notable achievement in every way, not only in the perfection of workmanship, but in the certainty and in the promptness with which it was carried out.

MARBLE WORK.

THE extent to which marble was used in interior and exterior ornamentation, as well as in actual construction by the ancients, bids fair to find its counterpart, if not its rival, in modern architecture. Nor is it to be wondered at that the ancients used marble so largely in the ornamentation of their buildings, for no stone possesses more beauty of appearance, more richness of effect and more delight to the eye than this ever beautiful mineral, delved from the earth in various lands and brought to such perfection of finish and coloring under the deft hand of the marble-worker.

The architect of our day is as deeply indebted to the use of marble in his work and design as the architect of yore. He has not been slow to perceive its value in ornamentation of every description. And in this he has been fortunate in meeting the taste of the layman who, whatever his shortcomings in knowledge of the appropriate in architecture, is ever ready to lend a willing ear to suggestions as to the use of this—the queen of all stone used in the building art.

The late Richard M. Hunt was particularly felicitous in the use of marbles, and no architect knew better than he how to use it to artistic effect. It is to be seen to advantage in many of the splendid examples of architecture which his genius created, and the reproductions shown in the illustrations in this number convey but a faint idea of the original work.

It fell to the lot of Messrs. Batterson & Eisele, of 431 Eleventh Avenue, New York City, to carry out in detail much of the work of the late Mr. Hunt in some of the finest examples of his work shown in these illustrations. To this firm he intrusted the work which he recognized as being an important factor in securing desired

effects, and in enriching the coloring and beauty of the skilfully-designed chambers in such magnificent structures as "Marble House," "The Breakers," "Biltmore" and other noble examples of architecture.

Those who have seen the interior of "Marble House" will not easily forget its splendor. The main entrance and stairs are in beautiful Sienna marble, brought to this country from the Italian mines from which the ancient sculptors secured the stone from which they chiseled their wondrous works of art. The dining-room is finished from floor to ceiling in the richest of dark pink Numinian marble brought from Africa, carved in superb life-like figures and bas-reliefs, after drawings by Mr. Hunt. Strikingly noticeable in this room are the large and beautiful monoliths of English alabaster. These huge columns and pilasters are 14 feet high and 2 feet in diameter, and Messrs. Batterson & Eisele are authority for the statement that interior columns of such proportions have never been superseded in the United States.

On leaving "Marble House," one cannot help taking a lingering glance at the exterior and its approaches, with the richly-carved basin of marble near the entrance. The remarkably fine carving in "Marble House" could only be carried out by selected and experienced workmen under skilful superintendence, the privilege of which, it may not be out of place to add, fell to Mr. John Eisele, of the firm named above.

Mr. Cornelius Vanderbilt's home, "The Breakers," occupies a prominent site on the ocean front, lined by summer palaces which has made Newport famous as a watering-place all over the world. There the use of marble is shown in almost perfect effect. The billiard-room is pronounced by critics to be the finest specimen of mosaic and marble

work in the United States, and cannot be surpassed, in modern work, in any part of Europe. The walls are finished in light green Cippolino marble, highly polished, while the floor and ceiling are finished in a rich pattern of mosaic-work. The centre panel in the ceiling is admirably executed, with its elaborately-carved frame of English alabaster, the scene portrayed being from a bathing chamber in ancient Pompeii.

No more delightful retreat could be found anywhere than the loggia in "The Breakers," where we are brought face to face with some of the richest mosaic-work in this country. For the execution of this work Messrs. Batterson & Eisele cannot receive too much praise. The mosaic ceilings, floors and tympanum, as will be observed in the illustration in this number, are in a design of Italian Renaissance. To faithfully describe the other beautiful marvels of workmanship in marble in "The Breakers" would occupy too much space, but passing mention should be made of the remarkably striking baths carved out of solid blocks of Italian statuary marble.

Some exceptionally fine examples of marble-work is to be seen at "Biltmore," and Mr. George Vanderbilt speaks with some enthusiasm of the library and breakfast-room. The former contains a large, rare, Japanese mantel, while the latter is trimmed in deep red Numidian marble, beautifully rich in color and effect. The plant-room, for tropical and other arborial growths, contains Numidian marble, Gothic capitals and bases, and there is an elaborate fountain in the centre, the basins of which were carved out of solid blocks of stone. The effect is striking, and forms a picture not easily effaced from the memory of the visitor.

Some very fine specimens of marble-work by Messrs. Batterson & Eisele

are to be found in some New York City houses, particularly in that of Mr. John Jacob Astor, on the corner of Fifth avenue and Sixty-fifth street. The grand hall and arcades of the Astor residence are in Caen stone, with self-supporting stairs in the same material, the entire work being beautifully and elaborately carved. One of the finest marble halls done by them is to be seen in the city home of Mr. Ogden Mills, on the corner of Fifth avenue and Sixty-ninth street, in which the architects' design of a self-supporting elliptical staircase of solid white Carrara marble is admirably carried into execution. Other examples of their work appears in the Lenox Library, and in the palatial residences of Mrs. Matthew Livingston and Messrs. C. Oliver Iselin, Henry G. Marquand and Sidney Webster.

The use of what we may call the "Precious" marbles is certainly destined to increase in this country in all our more elaborate buildings. The rare artistic effects to be obtained by the employment of these materials have, of course, long been well known to architects, but we may say, that it is only to-day, that the profession is beginning to employ them freely. Superb color schemes are possible with their use, and in conjunction with mosaic give inexhaustible possibilities of decoration. Messrs. Batterson & Eisele have been both pioneers and discoverers in this field. They have been most enterprising, not only in presenting the finer marbles to the attention of architects, but they have invested large sums of money in obtaining the finest stones from all over the world. They have always in stock a superb choice from all the great quarries. Their resources are so ample and their connection so complete that quicker than anyone else they can supply the most unusual needs of the architect.

STEAM HEATING.

THE architect is dependent on the services, and frequently the suggestions, of others in carrying out an important plan for the construction of a building. Problems arise in engineering, heating, ventilating and the like, and the expert is consulted as to their solution. Hence, the architect relies, in a large measure, on the able counsel of the men who are devoting their lives to the professions which are allied to architecture. To be an architect, in our day, means to possess something more than a knowledge of the styles, the necessities of an interior plan, the framing of walls, partitions, columns and beams, and the calculation of the strength of materials, as well as their carrying power and their resistance to the elements. These are the subjects on which the architect of ancient and modern times required a more or less perfect knowledge.

But the exigencies of our modern day life have tended to bring forth skill in other directions. The engineer of our day—the architectural engineer, if the term may be used—is playing an important part in the erection of many of our modern buildings. The electrician, the steam-fitter and the various contractors who carry out the ideas of the architect in modern construction, perform functions which, but a half-century ago, were unthought of. What is popularly known as "modern improvements" are now indispensable in the residence, the institution and the business structure of our day, and it is impossible for the architect to possess that thorough knowledge of every branch of building necessary to carry into execution the details of his planning. Thus, he is

compelled to call in expert assistance on the various problems that do not deal with actual construction; and while it is true that the conception is his, the execution, both in detail and entirely, is left to the expert.

Let us take, for instance, the matter of the heating and ventilating of the modern building. It is not so many years ago that the simple fire-grate gave way to the open log-hearth of our ancestors. As the style of living became more luxurious among the masses, there arose a demand for heating and ventilating the home and the office by new methods. People found that wood and coal produced more or less dirt and inconvenience, and this became augmented when there came into general existence the four-story house, the five-story flat and the high office building. It was soon found that to transport coal and wood to a great height every day became both an inconvenience and an expense, and thus it came about that heating by register and steam-pipe came into existence. Then, again, the old method of ventilating by chimney or window was found to possess disadvantages in that it was either inadequate or that it was productive of colds and chills, particularly in winter. Hence, the automatic ventilation of buildings became desirable and is now in vogue all over the country.

The late Richard M. Hunt made a special study of the heating and ventilating of the buildings which he planned, particularly during the last quarter of a century of his professional career. For twenty-two years or more he had the able counsel and experience of Mr. J. D. Clarke, of 276 Water street, New York City, who holds high rank as

an engineer and who had the honor to carry out much of the important work in this direction to be found in the buildings erected from plans by the deceased architect. Some of the machinery and apparatus used was on an unusually large scale. This appears in the three palatial Vanderbilt places, "Biltmore," "The Breakers," and "Marble House;" the Goelet residence, "Ochre Court," and other prominent structures. The system adopted in most of these buildings was indirect radiation, a low-pressure plant being used.

It may be of interest to note that in "Biltmore" alone about 15,000 feet of superficial indirect heating surface is required to heat this great structure, with a boiler capacity of 300 horsepower. The temperature of each room in the building is regulated automatically, and literally miles of steam-pipes are used for connecting the radiators. The boiler-room is 100 square feet in dimension. "Biltmore" is also one of the few private residences in the country that has a steam laundry.

For the hot-water system of heating in "The Breakers" some twenty-five thousand superficial feet of heating surface was required, the plant being even more costly than at Biltmore. This is largely due to the fact that Mr. Hunt had to deal with the problem of building the boiler-house outside of the residence proper. The boilers adjoin the lodge and are located underground some three hundred and sixty feet distant from the residence itself, the heat being transmitted through a conduit nine feet high and six feet wide.

Ochre Court is another example of advanced work in heating and ventilating, though of a less extensive character, Mr. Goelet having spared neither

pains nor expense to secure as perfect a system as could be devised for automatically regulating the draught and temperature throughout the entire building.

The first important edifice in which Mr. Hunt used a low pressure, indirect steam-heating apparatus was the Lenox Library on 5th avenue and 70th street, New York City. This was some twenty years ago. In this he had the able assistance of Mr. Clarke. Other buildings in which this system was subsequently used by Mr. Hunt were: The Academic Building, West Point; the Gymnasium, West Point; the Naval Observatory, Washington; the Fogg Art Museum, Cambridge; the Library, Princeton; the Marquand Chapel, Princeton; the country home of Governor Morton, at Rhinecliff-on-Hudson; the Home for Aged and Indigent Women, Amsterdam avenue and 104th street, and the Guernsey Building, at 160 and 162 Broadway, New York, and the residences in the metropolis of Messrs. Ogden Mills, Harry G. Marquand, W. K. Vanderbilt, Columbus O'Donnell Iselin, Adrian Iselin, Jr., and others of prominence.

The steam-heating and ventilating apparatus in all these buildings were planned by Mr. Clarke and erected under his personal supervision. Mr. Hunt's ideas in heating and ventilating at times attained to an elaborateness which was in keeping with the desire of his clients to secure the most perfect system that could be put into operation, and Mr. Clarke consequently had the advantage of practically unlimited powers, which, coupled with Mr. Hunt's complete confidence in his capacity, enabled him to lay down some of the most extensive heating and ventilating house plants ever erected, one or two of them occupying years of thought and labor in the execution.

PORLTAND CEMENT.

IN the early part of this century, while many eminent engineers, in England, France and Germany, were striving to produce an artificial water cement, one Joseph Aspdin, of Leeds, England, obtained a patent, dated October 21, 1824, for the manufacture of what he termed Portland cement.

There were many other patents obtained at and about this time, but, while all these patentees and other experimenters were apparently satisfied with an artificial hydraulic lime, Aspdin went beyond and gave the grand finish to the whole by his discovery of the increased temperature of the kiln and consequent high specific gravity of the cement.

These various efforts were not attended with immediate beneficial results to those who had given so much time to the question, as the cement appears to have attracted but little notice for some considerable time after its invention, and the Roman (natural) cement continued for a number of years to be preferred and readily obtained a higher price, but within the past thirty years the great importance of Portland cement as a building material has been demonstrated to such an extent that its manufacture has grown to vast proportions, and it has a market in all quarters of the world.

Previous to the year 1870 the quantity of Portland cement imported into the United States was very small and was held at so high a price as to prevent its coming into general use. It was vastly superior, however, to the native cements, and the organization of several artificial stone companies about that year created a large and steady demand for the better article, which brought new importers into the field and caused a reduction in prices.

From 1870 to 1876, practically all importations were from England. This fact gave rise to the general impression that no true Portland cement was manufactured anywhere else, but, after 1876, there was a gradual encroachment from Germany, and the best known English cements, which had ob-

tained an extended reputation, principally through being the first in the field, were obliged to gradually succumb to the superiority of the German cement until, at present, more than half of all the importations are from Germany.

One of the causes for the superiority of the German over the English cements is the fact that German engineers and architects recognize the injustice of making arbitrary specifications and then accepting the offer of the lowest bidder under them, as is done in England. The Germans take into consideration the actual value of the cement for making mortar or concrete, and that, together with its price per barrel, determines which is the cheapest and best for use.

Whenever the conditions in building are such as to necessitate the use of a better hydraulic cement than the natural cements, produced in this country, careful architects and engineers demand the use of the best imported Portland cement. In following that rule, Mr. Hunt selected for use in all his work the cement made by the Alsen's Portland Cement Works, Hamburg, Germany, and known as the "Alsen brand."*

Notwithstanding the high reputation of the cement made by this Company, Mr. Hunt required that all deliveries should be carefully tested, and the wisdom of his selection has been confirmed by the fact that the most rigid inspection, such as was made when he was building the United States Naval Observatory at Washington, for instance, has failed to discover a single barrel that did not come up to the high standard set by the manufacturers, and in no case has any other cement that has come under the notice of his office proved to be of equal merit. Many thousands of barrels have been used in the various buildings which are represented in this magazine. The quantity of this cement used in building some of the private residences and in laying out the grounds around them equals that used

* Of which the United States agency is located at No 143 Liberty street, New York City.

in many of our large public works. In the house and grounds of Mr. George Vanderbilt, at Biltmore, N. C., there were six thousand barrels of Alsen's cement consumed in the building of the house, and in the residence of Cornelius Vanderbilt, "The Breakers," at Newport, R. I., over ten thousand barrels were used. This is not surprising, when we consider the great number of uses to which a cement of this character can be put. At Biltmore, for instance, it was used for the foundations of the house and the lower walls, the cellar floors, walks, fountain basins and coping for garden walls, making a stone superior to natural stone and at much less cost.

The small difference in cost between a high-grade Portland cement, like "Alsen's" and the cheaper grades, is not worth considering, when the safety and permanence of the work is considered. Furthermore, it has been proved that a cement like "Alsen's" is actually more economical than cheaper brands. An architect feels that he must have a Portland cement that is safe at all times and in all conditions and which is absolutely uniform. Aside from these points where cement work is exposed to the eye, as in walls, curbs, architectural mouldings and castings, etc., the beauty of work done with cement like "Alsen's" is greatly superior to anything that can be done with lower grades of Portland cement. Where stuccoing is required certain kinds of work are frequently accomplished and effects produced which would be quite impossible with most other Portland cements. This is largely owing to the fatty nature of the cement and its adhesive qualities, so different from the lean and hungry character of other cements which cannot be used for stuccoing, except they are used with but very little admixture of sand.

When Portland cement is to be used in the foundations of very heavy buildings, such as the "Manhattan Life Building," on Broadway, New York, it is of the highest importance that a cement of great strength and uniformity is employed. Hence, for filling the pneumatic caissons of such buildings as above the "Alsen's" cement was

used, the crushing strength of this brand having been found to be 10,000 pounds per square inch in twenty-eight days.

The exercise of exceeding care in all the departments of manufacture, insures that uniformity in quality that is most essential in Portland cement. The result of the experience of several years of these careful methods is seen in the building up of the largest trade of any cement manufactory in the world, and the production of the best Portland cement made.

It is very finely ground, insuring an ability to carry a maximum quantity of sand with the least loss of strength. While not a quick-setting cement, it attains a great strength in a short time, say twenty-four hours, enabling masonry work to be pushed with expedition and at the same time with perfect safety.

It will develop a greater degree of strength when mixed with sand than any other cement made, which proves it to be of greater practical value.

The most dangerous feature in Portland cement is the presence of too large a percentage of magnesia or an excess of free lime, showing cracks and distortions in the testing pats, the briquettes and an expansion in actual work that must be fatal to the soundness and reliability of the work. In this particular, Alsen's cement is absolutely safe and reliable. In no instance has it ever shown any indication of these dangerous features when subjected to tests to discover them. This is, unquestionably, the result of careful selection of raw materials and care in manufacture. It is of good color, making it eminently well adapted for making artificial stone.

When mixed with sand for mortar, it is not short nor brittle, but works smoothly under the trowel.

It is put up in good packages, enabling deliveries to be made with least chance of damage or loss of contents.

In short, the advantages claimed for Alsen's cement over any other Portland cement is owing to its greater strength and absolute reliability. It is not only the safest Portland cement to use, but at the same time the most economical.

THE BUILDERS OF BILTMORE.

IT is doubtful whether, either in the Old World or New, a builder has ever erected a nobler residential edifice than the Southern home of Mr. George Vanderbilt. Selected from a number of his compeers for the performance of such a great work, he would be unworthy of his calling had he not taken pleasure in every hour of his task, and pride in its accomplishment. Biltmore is a monument to the architect by whom it was designed, and next to the architect it is a monument to the skill of the mason who carried into existence that design.

Not during the three generations of the Weekes family of builders had any of its members ever dreamed of erecting such a superb and costly seat. Selected to be the masons of Mr. Vanderbilt's home, Messrs. D. C. Weekes & Son began their labors in the summer of 1890, and, after five years of continuous effort, Biltmore today stands out against the skies, overlooking the beautiful Blue Ridge Mountains, seen at a great distance, owing to its elevation of 2,200 feet above sea level. No wonder that the traveler goes out of his way hundreds of miles to view this magnificent creation of man's brains and handiwork.

The builders of Biltmore, having undertaken the task, they relinquished all other contracts, and, from the commencement of the foundations until this day, Mr. H. C. Weekes, of the firm already named, devoted himself solely to the erection of the structure, the conditions necessitating his being in the saddle during a large part of the time of his superintendence.

It was thought, at the beginning, that a quarry on the Vanderbilt estate might supply the stone necessary for the building, and Mr. Weekes opened up his quarry. But the stone—gneiss rock—was found of utility in the foundations only, and Indiana limestone was used for the main superstructure, some twenty thousand feet of face-rock being used. Some of the pieces of carved stone set in place by the masons were very large, one in the

retaining wall, for instance, weighing over three tons.

To describe at length the detail of construction of this retaining wall would require more space than can here be given thereto. Suffice it to say that this wall is 333 feet long and that it has a base varying from seventeen and a-half feet thick at the base to two feet in thickness at the top. It was started at different thicknesses, according as the grade raised or lowered, and it was underlaid with a concrete foundation twenty feet in width.

Beyond this great retaining wall appears the esplanade, 333 feet in length and 75 feet in width. In the centre of this esplanade is a beautiful fountain, some thirty feet in diameter.

Entering the main floor from the terrace, the visitor is at once struck with the beauty of the winter garden, which is built in octagon form, and in size is 60 feet square. From the winter garden the best view is obtained of the main floor. All the principal rooms are seen from its many large windows in almost kaleidoscope completeness. To the west is the *salon*, 40 feet in length. To the north of the garden and the corridors surrounding it, is the banquet hall, and west of this hall is the breakfast-room, beyond which is the main kitchen.

The banquet hall is notable not only for its beauty of interior, but also for its size and construction. It is 72 feet long, 42 feet wide and 70 feet high, with one span and a dome ceiling. At the western end appears three massive triple fireplaces, of almost gigantic proportions. At the eastern end there is an organ loft and a balcony for musicians.

Another feature of the main floor is the living hall, 60x30 in size. This hall runs up to the top floor. Immediately west of the hallway under the main hall is the music-room. There is also a swimming pool 60 feet long and 30 feet wide, adjoining which are needle baths, sprays and the like.

North of the living hall is the tapestry gallery. Three large panels have been built in the walls to receive valuable tapestries to be placed there by

Mr. Vanderbilt. At one side of the gallery are two large stone fireplaces, in sixteenth century decoration.

To the south of the gallery, which is 75 feet long, the library is entered. This handsome room is 60 feet long and 40 feet wide. It has a single span, and one of the girders weighs over fourteen tons. On top of this enormous girder is a chimney which runs to the roof to a height of 21 feet. It will thus be observed that the builders had some interesting problems to solve during the construction of Biltmore.

Emerging from the library we come on the Library Terrace, a plaza 35 feet wide, which leads down to the south terrace, which is over 300 feet long. On this terrace is a bowling green.

The *porte-cochère* is worthy of a passing glance. It adjoins the gun-room and billiard-room, to the east of the banquet hall.

Ascending to the upper floors we find a vast succession of sleeping chambers and some twenty bath-rooms. Mr. Hunt was very happy in the arrangement of these floors, each guest, in whatever room he may be placed, having access to a bath-room.

Emerging once more into the open, and winding our way to the south of the esplanade, we find a hundred-foot terrace, containing large basins for aquatic plants. To the west end of this terrace is a tennis court, and there are similar courts to the east and south of the terrace.

Near the house itself is the stable, which is of stone and which contains accommodation for about forty horses.

It is not generally known that Biltmore stands in the midst of some sixty to seventy thousand acres of ground, and that the total extent of Mr. Vanderbilt's holdings in the vicinity aggregates about 100,000 acres. This gives more than ample room for the necessary game preserves, shooting boxes, trout streams, etc., that may be desired by the owner of such a domain. The lands in the neighborhood of the houses, however, are treated to some landscape effects, designed by Frederick Law Olmsted, the landscape architect. These effects are produced in a measure by calling in the work of the mason in the way

of constructing bridges across streams. There is also a big dam, 125 feet long and 30 feet high, beyond which is a beautiful lake, about one-quarter of a mile in length, which could be utilized for rowing and fishing. There is a dam about one-quarter of a mile above the main dam, so built that in case of a freshet the water will fall into a trap, which is perforated, and when the trap becomes overweighted sufficiently heavily it lifts a gate, opening on a sluiceway, so as to allow the water to pass out into the lake. The reason for this arrangement is that the soil is light and the lake would otherwise be filled in a year or two, owing to the freshets in this mountainous region in the southwest section of North Carolina.

Among the general features of Biltmore the following items may be of popular interest:

Its extreme length is 375 feet, and its extreme width, from the *porte-cochère* to the westerly end of the breakfast-room and music-room, 192 feet. Still, its beautiful proportions seem to diminish its size.

It has about one hundred rooms in all. It contains three elevators, and it is said that eighty servants will be required when it is fully occupied.

Over 11,000,000 bricks were used in the construction, and they were made out of clay on the estate. Of course there was the stone in addition.

The description given above merely outlines, in a very faint manner, the work done by Messrs. Weekes & Son at Biltmore. That they did all this work with as much satisfaction to Richard M. Hunt as to the owner of this estate, and that they handled large numbers of workmen engaged at various points of the grounds with such skill that from foundation to completion no hitch occurred, is a lasting credit to their ability. Not only did they carry through the mason-work, but they contracted for the plastering and the ornamental work in the plastering, at one time having about three hundred and fifty men employed.

To have erected Biltmore alone is a task that might well be pointed to as the one single achievement of a lifetime.

MACHINE-MADE MORTAR.

HERE are no materials used in the construction of a building that are of more importance than the mortar and plaster. Their function is equal to that performed by any other material that enters into the fabric of the edifice. With the uninitiated they practically cut a small figure in the conception of a building. People would put many other things before them which, really, are not comparable to them in importance. Wood-work and trim they would certainly rank ahead of them. The architect or the practical man, however, makes a very different classification. He not only knows that of the physical bulk of the building plaster is one of the largest elements, and that habitability, stability and even sanitarness of a structure, depend in no small measure upon the careful selection of good plaster.

Plaster is almost as old as house-building. It has been an important material in the builders' craft from the earliest days of the Egyptians. Yet, curiously, the march of improvement which has affected almost all other materials has not touched plaster until quite recently. Even to this day much of the mortar and plaster used is manufactured very much as the Romans manufactured it, only with much less care and skill that these great builders gave to the process. The value of machine methods in stone-cutting, wood-working of all kinds, in the manufacture of iron, etc., is fully acknowledged. People easily take in the certainty, the reliability of machine work, and appreciate its greater cheapness, and the immense economy which it makes possible in the matters of time and cost. Even the hod-carrier has been replaced by machinery. Nevertheless, builders are content to prosecute the making of mortar and plaster by the old tedious antiquated methods. The United States Mortar Supply Company was the first to bring about the necessary innovation and improvement, and the late Mr. Richard M. Hunt was the first

architect in this country to introduce the use of machine-made mortar into the actual work of buildings. He recognized at once the superior qualities and merits of the new article, and made the first step towards demonstrating what experience has since proven and established beyond question, that the plastering work of large and costly buildings can be completed in less time, at much smaller expense, and with much greater certainty by the use of machine-made mortar than is possible with the old kind of material. He demonstrated, in one step, its valuable advantages, its economy, sanitarness, and not only used it subsequently in all the great buildings which he created, but he recommended it cordially. To-day the products of the United States Mortar Supply Company are almost invariably used in all the finer and most costly buildings in New York City.

In a sense there is nothing experimental about machine-made mortar. The improvement did not involve the use of unknown or untried material. It necessitated no new combinations; nothing, in short, that entailed any risk whatsoever. What the company undertook was, by the careful selection of the old ingredients, aided by the more perfect combination of them by machinery, to do away with the unreliability, the tediousness, the failures which were never entirely avoided by the old method of manufacture, even when carried on with the utmost care. The rapidity with which the machine-made article won the unqualified favor of practical men demonstrated its advantages, so that even those who had a leaning towards antiquity and preferred traditional value to actual results were convinced. Progressive architects like Mr. Hunt, and progressive builders, fell into line at once, and the fact now stands as a matter of history that in all the greater buildings recently erected in New York the products of the United States Mortar Supply Company are used exclusively.

TILING AND FIREPLACES.

THE grandeur of "Biltmore," both in exterior and interior, has been so largely dwelt upon that it may be appropriate to say a few words about the marvellously fine work in the way of tiling, mantels, wainscoting, etc., which adorns the interior of that magnificent structure.

An evidence of the extensiveness of this work is shown in the fact that The Bradley & Currier Company, of New York City, which had the contract for a large part of this work, were eight months in completing the tiling for the bath-rooms, toilet-rooms and hallways, the swimming-tank, fireplaces, etc., put up by them in "Biltmore."

Although it might be presumed that the bath-rooms are most elaborate in decoration, the visitor will find them devoid of gorgeousness. The wainscoting is of the simplest character; there is no embossing, no coloring, no ornamentation. It consists simply of 6-inch squares of enameled cream tile, with moulded sanitary bases and caps, the floors being of white vitreous tile of a variety of sizes.

The lounging-room is a striking piece of art in tile. It is, indeed, tiled to the ceiling. The girders and posts also are covered in ivory-white tile, with a moulded sanitary base and cap.

The kitchen walls, laundry and drying-rooms, pastry kitchens and cook's pantry are all wainscoted to a height of over 5 feet, the very inlets in the window-cases being also tiled, the effect produced being very rich and unusual. The floors, too, are of American tiles. The kitchens are in ivory tile, and tile surrounds the ranges, the entire rooms, including the returns and doorways, being tiled 5 feet high.

A fine contrast between wood and tile is to be seen in the butler's pantry at "Biltmore." This is a large-sized chamber, where the walls beyond the wood-work are tiled to the ceiling. The effect of this contrast, where the work is so superb in character, can only be realized by a visit to this compartment.

The lower halls or corridors of "Biltmore" present a very pretty and

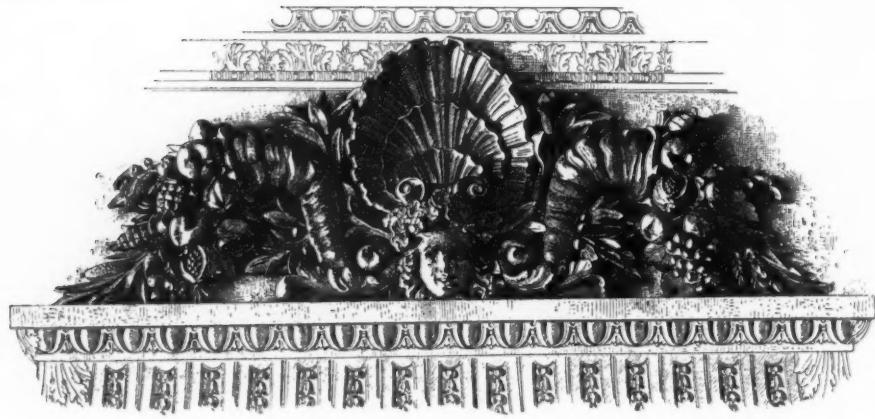
attractive appearance. The floors are set in Bock and Hydraulic tile of red and buff colors, making an exceptionally handsome finish.

An evidence of the costliness of the master of "Biltmore" is shown in the fact that all the servants' bath-rooms and toilet-rooms—and they are quite numerous—are equal in finish and workmanship to the private rooms of a similar character.

In addition to the above work in tile, all of which was done by The Bradley & Currier Company, the carriage porch at the main entrance is a feature, the flooring being laid with heavy French corrugated tile. The basement and sub-basement of the structure are also tiled, and these, in addition to the tiling on the first, second, third and fourth floors produces an ocean of tiling, which covers acres and acres in area, and comprises the largest contract of its kind ever executed in a private residence.

Tile-work of a similar character to that seen in "Biltmore" was placed by the company named in the handsome residence on the southeast corner of Fifth avenue and Sixty-second street, New York, owned by Mrs. Josephine Schmid. Vast quantities of beautiful tile-work are here to be seen in the kitchens and servants' rooms, and in the bath-rooms on the second, third and fourth floors. The kitchens are tiled to the ceiling in enameled cream tiles, 6x6 in size, with moulded sanitary bases. The bath-rooms are wainscoted 6 feet 6 inches high with 6x6 cream enameled tiles, while the floors are in 3-inch hexagon white, vitreous tiles, with sanitary bases and moulded caps.

A glance is merely given above at the work accomplished by The Bradley & Currier Company in the way of tiling. Examples of their fine cabinet-work are seen in the homes of some of the best people in New York. Their extensive warerooms, on Hudson and Spring streets, present an almost bewildering array of superb mantels and fireplaces of original design and workmanship, and some exquisite effects in antique are to be seen there.



THE HEATING OF BUILDINGS.



DROP of twenty degrees in the average temperature in twenty-four hours is apt to raise in the mind of each householder the question as to whether or not he has made a wise choice as to the heating apparatus of his new house; whether or not he is to have as much trouble as he had last winter in his old house, or what he shall do with the house that is going to be the new house shortly; each one having an interest in the question of more or less immediate effect; with the suburban householder, in fact, this is about the period of exchanging confidences, laughing over Mr. Bunner's story in *Puck*, and thinking that, after all, there is many a true word spoken in jest.

In all considerations of the problem we shall be compelled to take into account not alone the question of heating, but also that of ventilation, since the true problem that confronts each one of us is to introduce into each room in which we are a quantity of air that shall supply the needs of all of its inmates for both heat and life, remove the air which has served its purpose, introducing the fresh air in such a location as to cause no discomfort, and at such a temperature as to make the atmosphere that we are sen-

sible of, agreeable. Some may object that ventilation has no business in the heating problem; but when we consider that every house, no matter how carefully it is built, cannot be made absolutely air-tight, and that in the average house, the usual normal change of air in the room amounts to from one-half up to as high as one change of air per hour, and that this air must find a vent somewhere, it seems to be rational to make a proper provision for heating this air which leaks in, in spite of us, and for removing it when it becomes vitiated, along with the other air; this is especially the case where the expense of the heating apparatus bears quite a large percentage to the total cost of the house: but where the amount of discomfort due to a lack of ventilation, especially in times of illness, is almost incalculable and could be avoided by a small outlay and proper planning at the beginning.

Our programme then shall be to state briefly some of the points which should be considered in the double problem of heating and ventilating within practicable limits, of the various classes of buildings in such a way as to be interesting to the professional, and instructive to the layman.

Now there are, in the first place, a few general truths to be remembered. These are: (a) That air moving at a

velocity of four feet or more per second feels cold to the skin if its temperature is lower than 90 degrees, and as a consequence we must be careful how, in ball-rooms and other places, we admit the fresh air which is necessary to maintain the temperature at a reasonable limit, where it can strike on persons in evening dress. (b) Warmed air has a considerable capacity for moisture, and will therefore cause considerable discomfort to a person breathing it, before its temperature has been reduced by mixing in a room, and as a consequence should not be discharged anywhere near the head of a bed, or where it can flow over the bed directly or parallel with the bed, as in either case its effect will be unpleasant. (c) The bodily heat of a person is of considerable amount, and where numbers are gathered will have a very marked effect on the temperature of a room. (d) In almost every room considerable quantities of air leak in or filter in, amounting on an average to about one change of air in each hour and twenty minutes. (e) Wherever a difference of temperature exists, a transfer of heat is constantly going on from the higher temperature to the lower temperature, and this transfer is very much accelerated if air currents pass over either of the surfaces. (f) In all cases time is an important element. (g) Heat is simply a form or manifestation of energy, or an indication that work is being done.

Now buildings to be heated may be broadly divided into certain classes, and these we shall take up in their order, discussing the proper method to pursue for each one.

The moderate-sized brick or frame dwelling of the summer resort, town or village of about 1,500 square feet in area or less, constitutes probably the largest class of the isolated dwelling with which we have to deal in this country. These cannot be more rationally heated than by one or more hot-air furnaces, using either coal, wood, gas or electricity as the source of heat. The best way of setting such a furnace is to provide a room in the cellar about 10 feet square, with a large opening to the outer air on any aspect but the

south; preferably the opening should be to the north. This room acts as a supply and filtering chamber, and from it the air for the furnace should be drawn. The duct to the furnace should be taken out from near the top, then dropped down along the side wall and into the furnace at the bottom; in the event of its being exposed to strong wind currents deflecting partitions may be placed in it so as to check them somewhat, increase the travel of the air, and prevent it from flowing more rapidly through the furnace than it should, and the lead to the furnace should be provided with a swinging damper which can be readily manipulated from the butler's pantry, the hall coat closet or some convenient place on the upper floor. The furnace may be either of the portable type or brick-set. For the larger classes of houses the brick-set is perhaps desirable, but in the greater number of cases the portable type is preferable by reason of the fact that it is more easily cleaned, radiates a certain amount of heat into the cellar, warming the floors of the principal rooms, and a slight change in its location can be accomplished without the great expense entailed in moving a brick-set furnace, if it is found necessary. The question of make should be decided by the following general conditions: (a) All internal passages should be easily accessible for cleaning, whenever wood or coal is used, as any soot or dirt collecting on the inner surfaces is sure to affect its heating capacity. (b) The joints should be so designed that it is easier to make them right than to make them wrong, and so that they will remain tight of themselves. (c) The smoke passages should be long, and about of uniform size throughout. (d) The grate should be of the simple gridiron type, with a central dumping portion. There should be a little hole above it in front to reach through the ash door, so as to remove clinkers in case of need, and a small sifting grate below to sift the ashes that fall from the main grate. (e) The fire-pot should be wide rather than deep. Gas should only be burned in a furnace designed especially for its use, and is to

be recommended in many cases for its simplicity, cleanliness and economy. Electricity is at times very desirable but should only be used under the direction of an expert. The furnace should be of ample capacity; say the fire-pot 42 inches in diameter for a house two and a-half stories high, 1,200 square feet of area, and it should be placed generally a little northwest of the centre of the house, with 10-inch round smoke pipe connecting to an 8x12 smoke flue. If there is a good draught or a tile-lined flue is used 8x8 will do at a pinch, but 8x12 is very much better. If the house has its greatest length parallel with the prevailing wind, the furnace should be placed nearer to the windward than to the leeward side, and if cold storms are likely to come from a direction opposite to that to which the prevailing winds blow in the winter time, then the main furnace should be reduced a little in size and a smaller furnace placed at the opposite end of the house, the one from which the cold storms are expected, so as to convey the heat over there; thus in the vicinity of New York City a long house facing the south should have a furnace on the westerly side of the centre line, say the westerly end of the middle third and a supplemental furnace of smaller size near the easterly end of the house. In times of ordinary cold weather, with the winds from the west and northwest, the house will be comfortably heated with the one furnace; in times of easterly storms, and in times of extremely cold weather, the supplementary furnace will be needed as well. This will effect a considerable economy in the cost for coal, and simplicity in the handling of the furnace. All the flues should of course have double connections, so that one furnace can be used for the entire duty.

The hot-air should be led from the top of the furnace to the bottom of the various vertical flues in round pipes with easy bends where changes in direction are necessary; all of the pipes being covered either with 1 inch of hair felt and then covered again with canvas, or else made double; the preference being for the hair felt and canvas

covering. They should also be given a rise from the furnace to the bottom of the flue of as much as practicable, but certainly not less than $\frac{1}{4}$ inch to the foot; the vertical flues should be laid out with one or more to each room; single where running in interior partitions, except where they are running behind fine decorations, in which case they should be double and double in exterior walls. The position of the flue is largely determined by the position of the hot-air register in the room; since, owing to the exigencies of the framing, it is necessary that they should run practically in a vertical line. There are three generally accepted positions for the register: first, in the floor; second, in the side wall near the floor; third, in the side wall near the ceiling.

In general the greatest satisfaction will be obtained if the register in the main hall, the only one where there is but one, is placed in the floor near the entrance door; if there are others, place two near the entrance door, either in the floor or in the side wall, as the preference may be, place one in the floor at some point where the regular usage of the hall will not make it necessary to walk over it; a third if need be in the sidewall. For all other rooms throughout, a register should be placed in the side walls just above the base, being placed in the transverse partition near to the outside walls. Generally, good architects place the furniture in the rooms as they are designing them, so that knowledge may be obtained to avoid placing a register behind a place needed for a bureau, a wash-stand or chair placed so as to catch a pretty view, also keeping it clear of discharging anywhere near the bed. In case no transverse partition is available, then the flue may be placed in the outside wall, made double and its area increased about 10 per cent. The required flue area should be calculated on two changes per hour, about 4 feet per second velocity in flue for the first floor, 7 feet per second for the second floor, 9 feet per second for the third floor, and an area of register corresponding in square inches to the area of the flue

taken from some convenient catalogue. The bath-room register should be made wide and low, and should be placed near the ceiling, but no other register should be placed very close to the ceiling, since the current of warm air there will cause a discoloration by the settlement of dust. If the bath-room register cannot be placed high up it should be put in the floor as far from the bathtub as possible. All of the rooms should have a ventilating flue of the same size as the hot-air flue, placed on the interior wall near the floor, and as nearly opposite the hot-air inlet as is practicable, so that there shall be a current of warm air from the register around through the rooms and into the ventilating flue. The ventilating flue should be carried up in the attic space and discharge into an unused room, or into a chimney of area equal to one-half the combined area of all the flues so as to maintain a constant suction on it.

Larger dwellings should be heated on the same general lines, except that the air used for the heating of the dwelling should be itself heated by means of radiators containing either hot water or steam, with one stack of radiators for each vertical flue hung so that there shall be at least 4 feet of vertical cold air supply underneath the stack, and at least 4 feet of flue above it, with direct radiators in the hall in sequestered places, and in the butler's pantry for use with the plate warmer.

In the larger dwellings care should be taken to place the hot-air registers at such positions in the side walls that the velocity of the entering air need not exceed 4 feet per second, that there shall not be a very great volume entering at any one point, and that it shall not come out in such a location as to flow over the shoulders of persons in evening dress. The large rooms, salons, parlors, reception-rooms and dining-rooms should be provided with means of tempering the air by permitting a portion of the fresh air supply to flow around the heating stack, thus mixing with the heated air and cooling it; this is necessary because the air of a room which requires to be admitted at a temperature of 95 degrees when the

room is empty will have to be reduced probably to 50 degrees when the room is full of people in order to maintain the general temperature at 70. The use of tempered air, however, should only be attempted where automatic regulation is had, or where there is an exceptionally intelligent man in charge of the plant. The air should be heated by the use of hot water run under a pressure of ten to fifteen pounds per square inch. The air supply should be based on two changes per hour in all reception-rooms and the like, and one and a-half changes per hour in all bedrooms with the velocity in the flues as heretofore given. The form of boiler to be used with hot water depends largely on circumstances, and should be purchased under guarantee that it will heat a given number of pounds of water through a stated number of degrees with a bright fire, the water being circulated by the boiler from a cold barrel to a hot one, both placed above its level, the cold water being maintained at a constant level in the cold water barrel and the amount determined by meter. Locate the boiler wherever it is most convenient, due regard being had for the necessity of carrying pipes at an even grade from and to it, and for the amount of coal which it is necessary to supply it with in the larger houses. To avoid liability to breakdowns in the larger houses there should be two boilers, each equal to the duty of heating the house to 70 degrees when the external temperature is 20 degrees, and there is a strong northeast wind blowing. The supply of fresh air to the heating stacks should be from a central chamber similar to that noted for the hot-air furnace.

In churches, if there are galleries around the side walls, the heating should be by hot-air, the flues discharging at about 6 feet above the floor level or vertically in the window sills so as to flow up along the glass, thus meeting and checking the cool downward current. There should be flues at intervals of about 20 to 25 feet on both levels, making provision for 10 cubic feet of air per minute per sitting. The air should be heated by means of a low pressure steam appa-

ratus with a radiator placed at the bottom of each flue, whenever it is possible to accomplish it. The radiator should be made in two sections so as to temper the heat of the air. There should be direct radiation in the vestibules and entrance and in the organ case, but not near any of the pipes. There should be exhaust openings equaling in capacity 50 per cent of the aggregate area of the hot-air openings, in or near the centre of the church, connected with an uptake chimney which should contain a steam coil so as to create a draught therein. The surface of the steam coil should be made about 10 per cent of the aggregate area of the coils used for heating the body of the church.

Where there are no galleries there should be double sash placed at all openings, small discharging flues placed in the sill and larger ones discharging from 8 to 10 feet above the floor line in the side walls, and there should be ventilation the same as before described.

Where churches of very large seating capacity are to be considered and especially where the floor slopes, they should be handled the same as a theatre.

In all cases of church heating the radiation losses should be carefully figured by means of the usually accepted formula in use by the German Government, and the amount of heat required to make them up added to the amount of heat required to warm the entering air from zero to 70 degrees, and sufficient capacity should be provided for in the boilers to make them good.

Each boiler should be calculated to be of sufficient capacity to supply the heat units required to heat from 20 degrees up to 70 degrees, and cross connections made, so that either can be used in case of need. For this purpose no boiler will prove as generally satisfactory as the ordinary horizontal return tubular boiler. It should be understood that under no conditions is it possible to warm a church satisfactorily by means of direct radiation as inexpensively as the method above outlined. It is possible to heat by direct

radiation where a single loop is placed under every seat and a hot-water circulation is used, but in this case no ventilation of any kind is possible and the results are likely to be far from satisfactory.

In the manipulation of such a plant the person having it in charge must keep constantly in mind the fact that the temperature of the entering air immediately after the services begin must be gradually reduced, so that, in about fifteen minutes' time, instead of the air entering at 90 degrees or thereabouts, it should enter at from 50 to 60. It is also necessary in designing to guard against the current of air flowing down along the exterior wall which will produce precisely the same effect as a draft, and which is exceedingly annoying for a distance out from the wall of about 6 feet, and some means should be taken either to render these currents agreeable or to break them up.

For the heating of theatres the fan system is the only practicable one, and the best arrangement is made when the fans are driven by electric motors, using the same voltage as is used for the lights, thus making a constant load on the electric light engine, using a larger size of engine than would be otherwise justifiable, requiring less attention of generators, and giving a higher steam efficiency for the engines. The exhaust steam from the engine supplemented with such live steam as may be necessary should be led through one large heating chamber, through which air should be forced by one fan on the basis of 10 cubic feet of air per minute for each seat in the theatre. There should be another fan discharging air untempered or cold air into a system of flues parallel with the hot-air flues equal to 10 cubic feet per sitting per minute.

The heating system should be divided into sections or subdivisions, corresponding with the natural subdivisions of the theatre, into orchestra chairs, orchestra circle, dress circle, balcony, etc., and a separate duct should run up supplying a series of small flues so as to discharge the air under every second or third seat, through high reg-

isters under the gallery or in the front of the gallery, with an entering velocity of not to exceed 4 feet per second. At the base of this duct, a junction should be effected between the hot air and cold air by means of a swinging damper controlled with a small series wound electric motor, with a double field winding, with the three wires required to operate the motor carried up to a central position in the section to be heated. Then, if the motion of the valve is made very slow by means of a proper reducing mechanism in connection with the motor, an attendant can regulate the mixture of hot and cold air so that the air entering under the seat shall always be maintained at the proper temperature to keep the temperature that people are sensible of at the desired point, maintaining the flow of air undiminished. The halls, corridors, lobbies and everything on the stage side of the proscenium arch should be heated with direct radiation. In the flies and in the roof space there should be strong ventilating fans exhausting the air from the theatre, but in each case the fans should be less in capacity than the forcing fan in the cellar, so that there shall not be a tendency to create strong indraughts whenever a door is opened.

The method of heat regulation by means of electric motors, as above noted, can also be accomplished when desired automatically, with great satisfaction, although so far as I know it has never been done precisely in this form, yet there are many cases where motors have been operated at this distance with absolute satisfaction, and there is no mechanical or other reason why it should not give equal satisfaction in this case.

Stores have always presented an exceedingly difficult problem, mainly because they were very rarely built in the beginning to be what they eventually developed, and as a consequence it was impracticable to obtain the space necessary for the heating plant.

For small stores, hot air, either as mentioned for the larger class of dwellings or for the smaller class of churches, is the proper thing.

For the very large stores the thickness of the flooring should be increased, say 12 inches, and a complete system of horizontal flues carried around in this space. A portion of them being used for discharging fresh air at the proper temperature through the ceiling into the rooms to be heated and the other portion to be used for the removal of foul air at the floor level. Each department should be provided with its own riser; the air should be warmed by means of exhaust steam in one large central coil and forced through the store by means of a fan run by a steam engine, so arranged as to give a very wide range in speed, since there are times when the flow of air must be very greatly increased in order to keep the store in a proper condition. The exhaust system should also be handled by means of a steam fan. Direct radiation should be used in the toilet with exhaust flues and fans for removing the foul air, and direct radiation should also be used in and around the vestibules; in general there should be one exhaust and one heating outlet for each 200 square feet of floor area, but better results would be secured by putting one for each 150 square feet.

In factories and in mercantile buildings where floors are divided up into large lofts, either a pressure system may be installed blowing air in from a single large fan after having previously warmed it over a single large heating stack ; but a more practicable arrangement is to run the exhaust pipe up to the roof, and just below the roof put in a reducing valve and a horizontal system of distribution pipes with risers running down, supplying coils on the one pipe system.

The amount of radiation required should be ascertained by calculation by taking the number of heat units transmitted and allowing for the heating of one change of air per hour, one-half the required surface being hung around the exterior wall at the ceiling and the other half at the floor level, dividing the coils each into two parts so as to regulate in a measure the amount of steam admitted. The risers should be put in on an average of say 30 feet apart so as to cover the whole length

of exterior wall; the return water or water of condensation should be collected at the bottom and returned by means of an automatically controlled pump into the boiler, the pump discharging through a feed water heater. Exhaust steam should be used entirely, but provision should be made to supplement with live steam where necessary.

Office buildings should be divided for heating purposes into two sections; one for the usual corporation offices which occupy the lower floors, and which should be indirect on the fan system, and the other, in the halls, toilets and all of the upper offices should be direct on the one-pipe system, tapping off from the exhaust riser at the ceiling of the highest story, and dropping down, allowing one riser for each pair of windows, and putting in a small radiator in front of each window. If a radiator of the flue type is used, extra heating and ventilation can be effected by making a connection underneath the window sill with the outer air, putting a dust screen of ample size in, and putting in a box base to the flue radiator; this will work with great satisfaction on a one-pipe system and will give very perfect ventilation in the offices, as has been demonstrated with a few radiators during the past three winters.

For apartment houses there should be a system of individual risers for each apartment, using a hot-water circulation, or else there should be a gas hot-water heater used, one for each apartment, the heater being located in the servant's hall or kitchen, where the amount of heat which is radiated, which is naturally small, will be of service rather than the reverse.

The matter of automatic heat control is one of great interest, especially where the attempt is made to introduce large volumes of fresh air at the desired temperature, or where the intelligent householder has to confront the problem of the unintelligent servant. It can be accomplished in some one of the following ways: (a) By mingling hot and cold air automatically by means of slow motion valve motors

and thermostats, one for each room. (b) By using quick motion valve motors and thermostats for each room, sending alternate gusts of hot and cold air through the flues, depending on their mingling to a sufficient extent to avoid inconvenience. (c) By using a quick motion valve motor and thermostat for each flue, alternately admitting and closing off the hot air so that the amount of heat admitted to the room is that needed to keep it at the desired temperature. (d) By regulating the combustion by controlling the damper through a thermostat from some central point, which should be subdivided further into e and f as below mentioned. (e) Controlling the damper of a hot-air furnace burning wood or coal by means of a thermostat, the damper being alternately either wide open and tightly closed or (f) moving slowly, it being preferable to run with the quick-speed motor and have the damper either wide open or tight shut. (g) By using a slow motion motor in connection with the thermostat, controlling the admission valve of a gas hot air furnace, thus regulating the amount of heat to the requirements of the house to be heated, which can be very effectively done by means of a slow-speed motor. (h) By the use of a high-speed motor regulating the admission of gas to a water heater, throwing it entirely on or off as the water rises above or falls below the desired temperature, or by using a high-speed motor to completely open or completely close the draught of the water-heating or steam-heating furnace, as the case may be.

In deciding on the merits of a heat regulating apparatus, it should be borne in mind, first, that the greater the simplicity of the mechanism the less liability there is for its getting out of order and the more certain is its action. Second, that since it is required to regulate within a couple of degrees the thermostat should be of extreme sensitiveness, that is to say, it should present a very large area of contact for the air to pass over an exceedingly small mass, if it depends on the difference in expansion of two metals, while if it depends on the

operation of one metal changing with the temperature while the other remains constant, one metal should be a very thin ribbon presenting a very large area and small mass, while the other metal should be in the form of a rod presenting a very small area and large mass. No other form of thermostat can possibly be as sensitive as one of this sort. Then again the contact points should be protected from dust, since the arc of their travel is a very small one, and particles of dust lodging on the contact points would

seriously interfere with satisfactory operation.

The subject is of too large a scope to treat except in the most general way within the limits of a magazine article. To each rule there are necessarily exceptions, most of the methods given are concurred in by the best engineers, but where not so universally accepted there are the best of reasons for the statements made, and no harm can come from following the advice, when it is put into execution by competent engineers.

George Hill.



ADVICE TO ARCHITECTS—HEATING BY GAS.

PERFECT house heating, like every other problem the solution of which is necessary to comfort in domestic life, is a matter of discarding the disagreeable features while retaining and enlarging the agreeable ones. It is amazing how much thought and effort, sometimes intelligent, but oftener not, has been directed to simplifying the domestic machinery, and also surprising to find that the conduct of a household is still a very complex undertaking embarrassed by innumerable annoying details in spite of improved construction, sanitary plumbing, electrical appliances and other forms of special construction in which the progress has been steady and marked. No branch of this vital matter has left so much to be desired as that of heating, which has hitherto defied all the efforts made for its solution on lines placing the most advanced methods within the reach of all classes. Indirect steam or hot-water heating is the most successful of all heating systems from the purely scientific point of view, but the cost of the necessary plant has restricted its benefits to isolated cases. The disadvantage of the system most popularly employed, that of the coal furnace, is the imperfect control it allows of the heat generated, and the annoyances and discomforts that arise from its use, and in handling the material from which it is obtained.

These considerations have directed scientific inquiry to the consideration of gas as a fuel, the desideratum being a heating agency that can be turned on and off as easily as the light produced from the same source, but without the employment of an open fire in a room. The peculiar adaptability of gas as a fuel has been widely appreciated in late years, and the satisfactory results obtained by its use, even in extravagant and crude forms, has naturally impelled scientific and practical effort to the construction of devices for a perfect combustion of gas and intelligent action in radiatory and kindred requisites. This effort has been so successful as to make it almost certain that apparatus for heating air and water by artificial

gas, as supplied in our cities, will find a place in all our buildings, which aim to be perfect in their appointments.

One of the most satisfactory in all respects of these devices is the gas furnace of The Vulcan Gas Heating Company, 19 West 42d street, New York, of which a sectional drawing is shown herewith. This furnace, described in a pamphlet recently issued, is no mere experiment. It originated on scientific lines and has been worked out practically in every refinement and adjustment. It has expert endorsement and the approval of a number of people who found it to respond to all the requirements of the severity of this climate last winter, a fact that is unanswerable testimony to its efficiency.

From an examination of the drawings it will readily be seen that all the advantages of the more expensive indirect steam apparatus are secured and the same ends practically reached. The flues designed for connection with the coal furnace in new buildings or those existing when alterations are contemplated, can be utilized in the installation of a Vulcan Gas Furnace; and by this simple operation a perfect system of indirect heating accomplished.

When hot water heating is called for in new construction or when the circulating plant is already in place, the gas hot water heater is as readily adjusted and the flexible gas fuel applied. In cases where supplementary apparatus is required the device has been found in practice admirably adapted for the purpose.

It is difficult to realize that the required heat for an entire dwelling can be secured in a moment's time with practically no more effort than that of lighting a match, that such heat may be increased, diminished or dispensed with at will. That no dirt, dust, obnoxious gas, foul air and burnt out atmosphere can enter the dwelling and that the complete rescue of the cellar space of the house, now too frequently hideous in its appearance and repulsive to all fastidious or

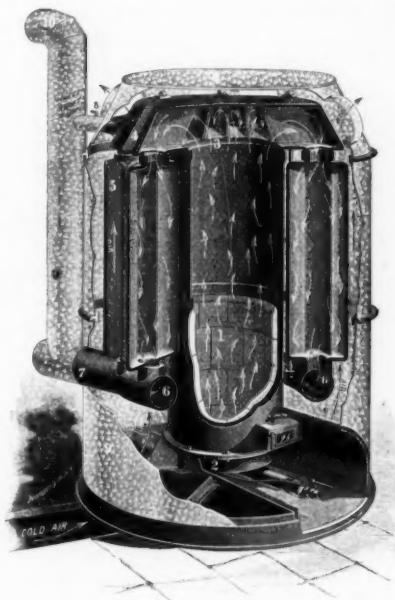
neatly disposed persons, can be accomplished. What can be done with the cellar apartment of a house can be readily surmised when it is realized that it can and should be as cleanly and wholesome as any other portion of the building.

By means of a thermostat installed in any part of the house, the degree of heat is instantly regulated when the temperature rises above or falls below a certain point, the consumption of gas in the furnace being at once checked or increased as may be necessary. The thermostat, however, is not a necessary appendage. Hand regulation from a convenient point in any part of the house or at the furnace itself has given most satisfactory results.

For heating large spaces—churches, schools, halls, stores, etc.—where a certain amount of heat is wanted at once and for a given time, this apparatus would appear to have been especially created. The facility with which it can be operated and the celerity with which all conditions can be met makes its installation in such edifices almost mandatory. In such places its perfect security against fire is a valuable feature. On the closing of the doors upon the retiring assemblage, the source of heat can be extinguished and the building be left with safety.

In explanation of the illustration it may be said that the Vulcan Gas Furnace has an outer shell of galvanized-iron from which the orifices lead to the hot-air ducts. The heater proper consists of a central brick-lined flue with a circular gas burner at the base. This flue or combustion chamber extends to the top of the furnace, the fire-brick running about half way up its walls. At the top it meets and connects with a crown or dome of cast-iron in one piece. This dome is without joints or bolts, and is deeply slotted, the slots forming passageways for circulation. The dome rests on a series of ten vertical, corrugated, radiators, each slot communicating with a corresponding radiator, and the radiator in turn connecting at the base with a circular hollow collector, or outlet ring, by means of which the products of combustion can thus freely pass to a chimney and thence to the outer

air, leaving the furnace at a temperature high enough only to secure their free movement and low enough to preclude all danger of conflagration. The dome is solidly and hermetically connected with the supporting columns, and the radiators or columns fit with equal exactness into the outlet ring. In this way, no products of combustion can enter into the air that is heated and supplied to the house. The air that goes through the house passes over the exterior of the heater, and inside the galvanized shell, on its way to the service pipes, and takes up heat from the cast-iron, fresh air being drawn in as fast as the heated and therefore lighter air has passed on for use and made room for it.



Hot Air Furnace.

The Vulcan Hot Water Heater is constructed upon similar principles. The same burner is used in each device, and the course of the gas and the movement of the water is identical with that of the gas and air in the hot air furnace. The practical value of these heaters has secured for them prompt recognition, as evinced by the number which have been recently placed in many of the finest residences in the metropolis.

BAY STATE HEATERS.

WHENEVER we desire anything affecting the health or comfort, to what do we turn to for it? Why, to experience of course. Is an architect suggested to build a house: What has he done? is the first question of the would-be builder. When the house is built what is then the first requisite to make it habitable—the heater, is it not? That being so the owner is face to face with one of the most important questions in his domestic economy. Surely this is a case where experience is required if ever there is one.

Of course, experience of the right kind is desired. Some do nothing but experiment with their own failures and cheerfully endow the world as far as they can reach it with discomfort. But that is not the experience meant, which is successful experience, and of this in the matter of house-heating there are few if any who have a better right to boast, not that they are given to boasting, than the Barstow Stove Company, of Providence, Boston and New York. The Barstows have been making stoves and furnaces for nearly sixty years, beginning with the old system which heated one or two rooms. They have kept up with the progress of the times and the demands of a people rapidly growing rich, for more comfort and greater perfection in their home appointments. Now the reputation of the Company as manufacturers of stoves and fine castings is literally world-wide.

The Barstow Furnace has the fewest joints possible, and they are subject to equal expansion, thus rendering it perfectly gas-tight. It contains an oscillating dumper and is furnished with an upright shaker, so that not only can the clinker and ashes be easily and quickly removed, but the operation does not require any stooping. A dust damper secures cleanliness and can be also used for checking and regulating the fire. The ash-pit has an ash-sifting grate and is very large and deep. The openings for the cold air through the base rings are unusually large, and the furnace stands very low, allowing it to be set in low cellars and yet give a good elevation to the hot-air pipes. The arrangement of the flues of this



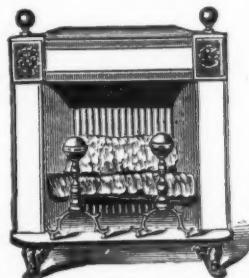
Bay State Portable Furnace.

furnace is such that the heat impinges equally on all sides of the radiator, so that all the hot-air pipes, if properly arranged, get an equal amount of heat, no one point being hotter than the other. One of the most important conditions is that the size of the radiator is in exact proportion to the capacity of the fire-pot; the result of this is that the processes of combustion fill the flues, and no part of the radiation is lost. There are besides non-corrosive door hinges, vapor pans, etc.

This furnace embodies all the improvements that have been made in heating apparatus since the first Barstow Furnace was placed upon the market.

The prevailing craze for antique furniture has created an enormous demand for the Bay State Franklin, which is an open, portable fire-place of antique design.

The Barstow Stove Company makes and sells also every kind and size of kitchen range and parlor grate. Their complete line comprises cast-iron, steel-plate and wrought-iron furnaces, portable and brick-set ranges, office and parlor stoves, fireplace heaters, tailors' laundry and gas stoves. On any point of heating or cooking the Company is ready to furnish full information, and may be addressed either at Providence, R. I., No. 56 Union street, Boston, Mass., or at No. 228 Water street, New York.



The Bay State Franklin.

THE WORK OF THE GENERAL CONTRACTOR.

SOME day when the history of American Architecture, during the past quarter of a century, comes to be written, a very interesting chapter will be the one that exhibits the development of the relationship between the architect and the several professions and crafts which aid him in his work.

The architect, himself, as is well-known, was at one time the master builder. He performed all the functions in the work of construction and design which are now allotted to a score of different hands.

The profession of architecture, however, has of course, come under the operation of the law of evolution, and this law necessitates, in the course of upward development, what scientists term "differentiation." This may be translated into plainer language as a making of differences—a creation of a number of parts acting in unison, in place of single individuality or organism performing for itself all the necessary activities.

For instance, under primitive conditions, the cobbler makes every part of a shoe, but in the process of development the making of each separate part falls into different hands, until finally nothing remains for him to do but to gather and put together the several pieces. So one by one in the course of years, the master builder or the architect has been deprived of his once multifarious occupations.

How far this process has been carried, few recognize to-day. Of course, long ago, the architect ceased to be directly concerned in any part of the work of pure construction. The mason, the stone carver, the carpenter, have emerged and separated themselves completely from the architect. But the process has been carried much beyond the mechanical crafts. It is said to-day that there are very few architects who are even personally competent to design on thoroughly scientific lines the iron-work of their larger buildings. Indeed the engineer is in a mild revolt against the architect, asserting that he, the engineer, has become the chief

factor in the construction of modern buildings, and that it is *he*, not the architect, who is the master mind.

Also, in plumbing and ventilation, the architect's authority is no longer co-ordinate with that of the specialist in these matters. Electricity, we know, has become so intricate a science and a science that moves so rapidly that it is completely the work of one man's whole time to keep himself abreast of progress. Even in matters connected with the actual work of design, there is a notable tendency for the architect to seek advice and assistance from specialists, as, for instance, in terra cotta ornamentation, and so forth.

This process of subdivision is one the end of which apparently is not yet reached, but must continue until, if the simile be permitted, the architect like the cobbler becomes merely an assembler of parts—an artistic assembler, of course,—who groups into an orderly arrangement a multitude of details according to a forordained aesthetic design.

In mechanical and technical matters, this subdivision is already fairly complete. We may say it is complete, for even in iron construction and sanitation, the majority of architects, save in their smaller buildings, rely upon expert advice. Our larger buildings are successful to-day almost in proportion to the subdivision of labor which the architect has permitted.

It is needless to point out that a successful building must have other qualifications than good design and good construction. A large number of the edifices erected in these times of ours have a financial function to perform. They are intended, not only to house people comfortably and healthfully, but to earn money for their proprietors.

Now, the financial success of a building is very closely related with what we may call the financing of the work of construction. It is not enough that the architect who has a given sum to spend shall get his build-

ing put up within the prescribed amount. It is not even enough that he shall establish certain standards for the performance of his work. It is well known that the same specifications in different hands do not always secure precisely the same result.

It is at this point that the experience, resources, reputation of an expert comes in. We mean the general contractor, the expert who assumes for the architect what is really the work of financing the building, allotting the contracts, spending the money. Just as it is impossible for the architect to be equivalent to the specialist in electricity, so is it impossible for the architect to possess the thorough knowledge and the close relationships with the building material markets that the great general contractor possesses. The latter, so to speak, lives in the market. His daily affairs are in constant touch with it. He is centred in the midst of affairs which are at best only occasional matters with the architect. It is the possession of these advantages which gives the general contractor his importance in the building world and makes him an important factor in the construction of all our larger buildings.

The late Mr. Richard M. Hunt was one of the quickest to recognize the tendency of the times, and was ever ready to adopt all the many assistances which modern development places at the disposal of the architect. In most matters he was a modern of moderns. He objected to all circuitous ways, and his office, it has been said, represented in every particular the best practices of the period. More than that, he gathered round him the best craftsmen of the day. Mr. Hunt was always free to acknowledge the great assistance which he received from those who necessarily were called to his aid. Indeed no small measure of his success were due to the excellent assistance which he received.

When Mr. Hunt was entrusted with the great Newport buildings, illustrated in this number, his choice of those who were to carry out his designs was particularly scrupulous and careful. The selection which he made of a general contractor was especially exact. In

confiding the construction of these notable structures to Mr. C. Everett Clark, of 166 Devonshire street, Boston, he selected a builder of national renown, whose experience and resources have scarcely an equal in this country. Mr. Clark's position is an undisputed one, and if to-day the great Newport cottages are models throughout in material used and technical skill employed, the result must be in some large measure credited to Mr. Clark.

A vigorous examination of these buildings discloses scarcely a single particular in which any improvement could be possible. They are a delight to the expert craftsman. We know of no buildings to-day which are comparable to them, and the amount of skill and labor involved in their construction can be estimated exactly only by the expert. In elaborateness and wealth of detail they are beyond comparison with almost any other domestic buildings in this country. Something of their richness and sumptuousness is shown in our illustrations.

Mr. Clark was the general contractor not only of "The Breakers," the residence of Mr. Cornelius Vanderbilt, but also of "Marble House," the residence of Mrs. W. K. Vanderbilt, "Ochre Court," the home of Mr. Ogden Goelet, and "Belcourt," which belongs to Mr. Oliver H. P. Belmont. He was also the general contractor for Mr. John Jacob Astor's New York house, on Fifth avenue, Professor Shield's house and Mr. Busk's house, both at Newport, and both illustrated in this number. Mr. Clark also did the remodeling of ex-Governor George P. Wetmore's house.

In short, as a result of his long experience, Mr. Hunt confided practically all of his later and greater work to the charge of Mr. Clark, with results which were unqualifiedly satisfactory both to architect and owners, and to all who are interested in the higher development of the builders' craft. We do not speak here of the less notable work which Mr. Clark has done, or even of the many important commissions which he has obtained from other leading architects. He is one of the busiest builders of the day.